



ETUC RESOLUTION ON NANOTECHNOLOGIES AND NANOMATERIALS

Resolution adopted by the ETUC Executive Committee in their meeting held in Brussels on 24-25
June 2008

Introduction

Nanotechnologies are emerging, trans-disciplinary technologies that enable structures or objects to be designed, manipulated and manufactured on a nanometer scale¹, i.e., the size of a handful of atoms or molecules. At this scale, the physicochemical properties of matter can differ significantly from those obtained at larger scales. What all these technologies have in common, therefore, is to produce objects, called nanomaterials, that have new properties and behaviours that cannot be obtained easily or at all with conventional technologies.

Described as the "engine of the next industrial revolution", nanotechnologies have a far-reaching development and application potential, especially in the fields of biotechnologies and medicine (diagnostic, treatment and prevention tools), information and communication technologies (miniaturization and increased storage capacities); energy (more efficient energy storage, conversion and production), agriculture and the environment (soil, water and air clean-up), etc.

Industry and Governments have taken this firmly on board. Public funding for nanotechnologies in the United States and Europe alike has risen steadily year on year. The European Union, for example, has decided to put 3.5 billion euros into nanotechnology research between 2007 and 2013 on top of private sector investment and national research budgets. The most frequently cited estimate is that the world market in nanotechnologies will amount to 1 000 billion dollars by 2015².

In terms of employment, it is claimed that nanotechnology development is likely to require an additional two to ten million workers across the world by 2014. Many of these jobs are likely to be created in Europe,

¹ Usually somewhere between 1 nm and 100 nm. A nanometer (nm) is equal to one billionth of a metre.

² The economic development of nanotechnology, European Commission, 2006
<http://cordis.europa.eu/nanotechnology>

mainly in start-up companies and in SMEs³.

Hundreds of consumer and manufactured products containing engineered nanomaterials or made with the use of nanomaterials are already on the market⁴, for example in the areas of cosmetics, sporting goods, textiles, food, paints, constructions and electronic equipment.

Products are being made today and placed on the market without knowing whether nanomaterials are released from them and what their potential impacts on human health and the environment may be. Workers all along the production chain from laboratories through to manufacturing, transport, shop shelves, cleaning, maintenance and waste management are exposed to these new materials. Nevertheless it is unknown whether the safety procedures implemented are adequate or the protection measures applied are sufficient. Workers and consumers are being exposed to products⁵ that contain nanomaterials unbeknown and uninformed about the potential risks. Nanomaterials are discharged and disseminated out into the open without knowing what the consequences may be and without effective ways of detecting and measuring them.

There is a growing body of scientific evidence to suggest that some manufactured nanomaterials harbour new and unusual dangers^{6,7}. Because smaller particles have a greater (re)active surface area per unit mass than larger particles, their toxicity may also increase.

While nanotechnologies may bring major benefits to our society, they also raise many concerns about their potential risks to our health and the environment.

In 2005, the European Commission adopted an action plan on nanotechnologies and nanosciences for 2005-2009, which called for an assessment of risk to human health, the environment, consumers and workers at all stages of the life cycle of the technology (conception, manufacture, distribution, use, and recycling).

Most research programmes, however, are still in the very early stages

³ *Ibid.*

⁴ www.nanotechproject.org/consumerproducts

⁵ In our understanding “product” encompasses a substance, a preparation or an article

⁶ SCENIHR (Scientific Committee on Emerging and Newly-Identified Health Risks), The appropriateness of the risk assessment methodology in accordance with the Technical Guidance Documents for new and existing substances for assessing the risks of nanomaterials, 21-22 June 2007.

⁷ IARC (International Agency for Research on Cancer): <http://monographs.iarc.fr/ENG/Meetings/93-carbonblack.pdf>; <http://monographs.iarc.fr/ENG/Meetings/93-titaniumdioxide.pdf>

and it will be a long way down the road before comprehensive information is available to give a clear picture of what risks the different manufactured nanoparticles may pose.

The European Trade Union Confederation (ETUC), its member federations and confederations, wish to do a first contribution to this important societal debate by pointing out those elements of the European policy that they see as essential to the responsible development of these emerging technologies.

The ETUC position

Nanosciences and nanotechnologies are new approaches to research and development (R&D) that aim to control the fundamental structure and behaviour of matter at the level of atoms and molecules. These fields open up the possibility of understanding new phenomena and producing new properties of matter that can be utilised in virtually all technological sectors.

The ETUC is convinced that nanotechnologies and manufactured nanomaterials might have considerable development and application potential. These technological advances and the new jobs they might bring may address peoples' needs, help make European industry more competitive and contribute to the achievement of the sustainable development goals set out in the Lisbon Strategy.

However, the ETUC notes that significant uncertainties revolve around both the benefits of nanotechnologies to our society and the harmful effects of manufactured nanomaterials on human health and the environment. The development of these emerging technologies and the products from them also poses huge challenges to our society in terms of regulatory and ethical frameworks.

The ETUC considers that if the past mistakes with putatively "miracle" technologies and materials are not to be repeated, preventive action must be taken where uncertainty prevails. This means the precautionary principle must be applied. This is the essential prerequisite for the responsible development of nanotechnologies and for helping ensure society's acceptance of nanomaterials.

The ETUC welcomes the European Commission's action plan 2005-2009 on nanosciences and nanotechnologies which is based on the safe, integrated and responsible strategy put forward in its 2004

Communication. Nevertheless, our analysis of the first Commission Report on its implementation over the period 2005-2007 reveals large gaps and deficiencies which ought to be eliminated without delay.

Where investment in R&D is concerned, we see and note a gross imbalance between budgets for the development of commercial applications of nanotechnology and those for research into their potential impacts on human health and the environment. The ETUC calls for at least 15% of national and European public research budgets for nanotechnology and the nanosciences to be earmarked for health and environmental aspects and to require all research projects to include health and safety aspects as a compulsory part of their reporting.

The ETUC considers that a standardised terminology for nanomaterials is urgently needed to prepare meaningful regulatory programmes. In particular, ETUC calls on the Commission to adopt a definition of nanomaterials which is not restricted to objects below 100 nanometers in one or more dimensions. This is important to avoid many nanomaterials already on the market to be left out of the scope of future legislations.

The ETUC is concerned at the holdup in the Commission departments' examination of the current legislative framework and its identification of the regulatory changes needed to address workers' and consumers' concerns about the health and environmental implications of nanomaterials.

After the asbestos scandal which cost the lives of hundreds of thousands of workers, and when the EU has recently introduced new legislation on chemicals that puts the onus of proof onto manufacturers, the ETUC finds it unacceptable that products should now be manufactured without their potential effects on human health and the environment being known unless a precautionary approach has been applied and made transparent to the workers.

In particular, ETUC considers that manufacturers of nano-based products should be obliged to determine whether insoluble or biopersistent nanomaterials can be released from them at all stages of their life cycle. In the absence of sufficient data to prove that those released nanomaterials are harmless to human health and the environment, marketing should not be permitted.

The ETUC therefore demands full compliance with REACH's "no data, no market" principle. It calls on the European Chemicals Agency (ECHA) to refuse to register chemicals for which manufacturers fail to supply the

data required to ensure the manufacture, marketing and use of their nanometer forms that has no harmful effects for human health and the environment at all stages of their life cycle.

Strict application of this principle must be used to encourage industry to fill the gaps in the scientific knowledge about the safety of engineered nanomaterials, especially the fate and persistence of nanoparticles in human beings and the environment.

The ETUC calls on the Commission to amend the REACH regulation so as to give better and wider coverage to all potentially manufacturable nanomaterials. Nanomaterials may indeed evade the REACH registration requirements because they are manufactured or imported below the threshold of 1 tonne per year. The ETUC demands that different thresholds and/or units (e.g. surface area per volume) are used for registration of nanomaterials under REACH.

The ETUC considers that the obligation to produce a chemical safety report for production volumes only above 10 tpa is another loophole that will allow many manufacturers or importers to avoid doing a risk assessment before putting nanomaterials on the market. The ETUC wants a chemical safety report to be required for all substances registered under the REACH regulation for which a nanometer scale use has been identified.

The ETUC also demands Annexes IV and V of REACH (exemptions from registration) currently under revision not to permit manufactured nanomaterials to evade the REACH requirements.

Workers engaged in research, development, manufacture, packaging, handling, transport, use and elimination of nanomaterials and nanotechnology products will be most exposed, and therefore most at risk of any harmful effects. The ETUC therefore demands that health and safety at work must have priority in any nanomaterials surveillance system. There is a great need for training, education and research in order to allow health and safety specialists (e.g. labour inspectors, preventive services, occupational hygienists, company physicians) preventing known and potential exposures to nanomaterials.

The ETUC calls on the Commission to amend Chemical Agents Directive 98/24/EC which it believes does not afford adequate protection to workers exposed to substances for which there are gaps in our knowledge about their toxicological properties. Employers must be required to implement appropriate risk reduction measures, not only when known dangerous substances are present in the workplace, but also when the dangers of substances used are still unknown. This would enable all manufactured

nanomaterials to be covered, along with many other substances that carry unknown health risks to which workers are exposed.

Workers and their representatives (e.g. safety reps) must be fully involved in risk assessment and the selection of risk management measures without fear of retaliation or discrimination. Moreover, they must be informed of the nature of the products present on their work places. The ETUC therefore considers that safety data sheets must clearly state whether nanomaterials are present. If toxicological or ecotoxicological data are missing, that must also be indicated in safety data sheets. The ETUC considers that significant efforts must be made without delay to prevent occupational exposures to already known manufactured nanomaterials. That will involve, in particular, exposure monitoring, health surveillance for workers and appropriate training.

The ETUC believes that consumers also have the *right to know* what is in a product. In many cases, manufacturers have published no information on tests done on nanotechnology products and their health hazards, or have not labelled consumer products as containing nanomaterials. Not being fully informed prevents the public from making informed decisions about the purchase and use of such products.

The ETUC wants all consumer products containing manufactured nanoparticles which could be released under reasonable and foreseeable conditions of use or disposal to be labelled. In addition, as part of the precautionary approach, ETUC calls on Member state authorities to set up a national register on the production, import and use of nanomaterials and nano-based products. Those measures would make it easier to monitor any human or environmental contamination and to identify where responsibility lay for any harmful effects.

The ETUC believes that Industry Voluntary Initiatives and Responsible Codes of Practices may serve a useful purpose pending implementation of the necessary changes to the current legislative framework and/or the introduction if need be of specific new European legislation to support responsible nanotechnology development.

However, the ETUC is prepared to endorse such initiatives only if the signatories undertake to involve workers' representatives in their design and monitoring, if there is an independent and transparent system for assessing compliance (e.g. by involving labour inspectorates) and if sanctions are foreseen in case of non-compliance. In addition, the ETUC demands that companies which adopt such systems disclose information

on the hazards and risks associated with their products and commit themselves to be fully accountable for liabilities incurred from their products.

Finally, since nanotechnologies have the ability to profoundly alter the social, economic and political landscape of our societies, it is essential that all interested parties have a full say in the discussions and decisions that affect them. The ETUC therefore calls on the European Commission and Member State governments to commit sufficient funds to ensure real civic participation in the current debate on these new technologies.