

State of the Implementation of the European Action Plan for Nanotechnology

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Nanotechnology has a two-fold potential, in offering solutions to many current problems and expectations of citizens; and in opening up opportunities for sustainable wealth creation and new employment by turning basic research into successful innovations. The European Union has long supported nanosciences. Actions to promote this key technology were already taken in the mid- to late 1990s. As a result Europe is in a leading position in nanotechnology. Now the European industry and society in general are entering the commercialisation phase, to reap the benefits of the new knowledge through innovative products and processes. To meet the challenges and to ensure Europe's competitiveness in this sector we need to join forces across disciplines, sectors and national borders. We need to increase investment, boost interdisciplinarity, create the necessary infrastructures, expand human resources and develop international co-operation to support research and foster innovation where an international dimension is more favourable. At the same time, we need to address the societal concerns brought about by the development of new applications. We also need to consider potential regulatory issues. These priorities are central to the European integrated, safe and responsible approach to nanotechnology, as proposed by the European Commission in two Communications, the European Strategy and the Action Plan 2005-09*.

In general, Europe enjoys a strong position in terms of producing knowledge in nanotechnology (e.g. publications), but in the past it has been weaker in transferring this knowledge into the timely development of novel industrial products and services (see e.g. the comparative indicators for publications, patents and start-ups). With regard to research funding, the European Commission has steadily increased the level of its funding for research in nanosciences and nanotechnologies. A total of almost 1.4 billion Euro has been committed under FP6 to more than 550 projects in nanosciences and nanotechnologies. Further, significant increases are expected over the duration of the 7th Framework Programme (2007-13**). More than 50 activities in the first calls of FP7 (published on 22 December 2006) directly address different topics in nanosciences and nanotechnologies***. On the other hand, the level of private R&D funding is lower in Europe in comparison to some other areas e.g. the USA and Japan. The challenge in funding R&D in this diverse and important field, is to focus on the most promising sciences and technologies, leading to higher-performance products and services on the one hand, and sometimes to "revolutionary" and not only "evolutionary" industrial innovation. Already, during 3 years, the percentage of industrial participation in FP6 "dedicated" nanotechnology projects rose from 18% to 37%, indicating a rapidly increase of industrial interest. This R&D should contribute to the Lisbon objectives: economic growth, employment creation, environmental protection and addressing social challenges.

Nanotechnology often benefits of an interdisciplinary approach. The challenge is for research but also for education and for the research infrastructures. The Commission is engaged via its actions and programmes such as Erasmus Mundus**** and Marie Curie***, or the "Research Infrastructures" part of FP7***, which also takes into account the opinions delivered of the European Strategy Forum on Research Infrastructures (ESFRI).

An open, balanced and science-based dialogue within the society is also promoted. The collaboration of researchers in natural sciences and the societal scientists is fostered, also contributing to the creation of a shared base of knowledge concerning nanotechnology. The European Commission has been pilot in promoting a societal dialogue. It is precious if other countries throughout the world launch initiatives similar to those carried out in Europe, so to enrich the dialogue as a whole and our have possibility of benchmarking and identifying the best practices.

Ethical issues are also addressed, and in January 2007 the European Group on Ethics delivered its opinion on Nanomedicine. All European FP research projects are submitted to a due ethical review, if the case.

With regard to regulation, a high level of public health, safety, environmental and consumer protection is aimed at. This requires the identification of safety concerns, the collection of appropriate data for an adequate health and environmental impact assessment of the products data, and action at the earliest possible stage through adjustments, where necessary, of risk assessment procedures for issues of nanotechnology. To address these needs, relevant research projects are funded; Moreover, also following an informal collection of information last year, impact assessment is a major component of the first calls of FP7 and the intention is to continue this support in further calls.. In the meantime, the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) has adopted an opinion on “The appropriateness of existing methodologies to assess the potential risks associated with engineered and adventitious products of nanotechnologies”. Briefly, this has recommended addressing various uncertainties with regard to potential hazards and exposure; addressing gaps in knowledge; and further developing guidelines and methods. At the same time, current analysis shows that the current regulatory framework is, in principle, capable of handling nanomaterials. Another opinion is being drafted, on 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. Apart from research-centred activities the European Commission is currently looking into the legislative issues of the increasing use of nanotechnologies and it is currently exploring the already existing European legislation applicable to nanotechnology and assessing its adequacy and appropriateness.

* <http://cordis.europa.eu/nanotechnology/> and <http://cordis.europa.eu/nanotechnology/actionplan.htm>

** <http://cordis.europa.eu/fp7>

*** http://cordis.europa.eu/nanotechnology/src/eu_funding.htm

**** http://ec.europa.eu/education/programmes/mundus/index_en.html

Note that the views expressed in this paper are those of the author, do not necessarily represent those of the European Commission and do not engage the European Commission in any way.