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Nanoscience and nanotechnology

European Parliament resolution on nanosciences and nanotechnologies: an action plan for Europe 2005-2009 (2006/2004(INI))

The European Parliament,

– having regard to the Commission Communication of 7 June 2005 entitled Nanosciences and nanotechnologies: An action plan for Europe 2005-2009 (COM(2005)0243),

– having regard to the joint report by the Royal Society and the Royal Academy of Engineering of 29 July 2004 entitled Nanoscience and nanotechnologies: opportunities and uncertainties,

– having regard to the Presidency Conclusions of the Brussels´ Competitiveness Council of 24 September 2004,

– having regard to the opinion of the European Economic and Social Committee on the Commission Communication: Towards a European strategy for nanotechnology[1] and its opinion regarding the above-mentioned Commission Communication of 7 June 2005[2],

– having regard to Rule 45 of its Rules of Procedure,

– having regard to the report of the Committee on Industry, Research and Energy and the opinions of the Committee on the Environment, Public Health and Food Safety and the Committee on Legal Affairs(A6-0216/2006),

A. whereas the Commission has adopted an Action Plan for the immediate implementation of a safe, integrated and responsible strategy for nanosciences and nanotechnologies,

B. whereas nanosciences and nanotechnologies have the potential – as multidisciplinary sectors – to benefit society hugely by the development of new products, materials, applications and services, thereby raising productivity and the quality of life in the EU as a whole,

C. whereas the Council recognises the important role of nanotechnologies in many areas and stresses the importance of continuing to generate scientific and technological knowledge in this area and of encouraging its use in industrial applications,

D. whereas the European Economic and Social Committee believes nanotechnologies could greatly help the EU to achieve the objectives set by the Lisbon Strategy,

1. Welcomes the above-mentioned Commission Action Plan, which defines a series of concrete and interconnected actions for the immediate implementation of nanosciences and nanotechnologies, based on priority areas determined according to future needs;

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1 OJ C 157, 28.6.2005, p. 22.

2 INT/277 - CESE 1237/2005.

2. Recognises the important role that nanosciences and nanotechnologies can play as breakthrough technologies in stimulating the achievement of the economic, social, and environmental goals of the EU; acknowledges the fact that nanotechnologies can address the needs of citizens (public health, energy, transport, sustainable development, etc.), as well as contribute to the EU's competitiveness and sustainable development objectives;

3. Notes that technology platforms, expert advisory groups, and action plans are useful instruments for helping to develop commonly agreed research agendas and deployment strategies in the field of nanotechnologies and nanosciences, thereby creating new jobs and enhancing economic growth;

4. Supports the objectives and initiatives set out in the above-mentioned Commission Communication of 7 June 2005; welcomes the clear focus in that Communication and in the above-mentioned Action Plan;

5. At the same time, stresses the need to increase publicly funded investment in R&D; realises that the fragmentary nature of the European research landscape reflects the easy availability and relatively low cost of nanoscience research, but is also aware that funds need to be set aside for the establishment and maintenance of the necessary large-scale facilities, including, in particular, clean rooms, lithographic processes and very costly analytical procedures; in this regard, expresses its concern at the current level of European public investment in nanosciences and nanotechnologies, recommends that the ambitions set out in the above-mentioned Action Plan be appropriately matched in financial terms and supports the Commission's readiness to very substantially increase the resources devoted to research in this field, which is of fundamental importance to Europe's future development;

6. Considers that Europe needs a coherent system of world-class R&D infrastructure in order for the EU to remain competitive in the field of nanosciences and nanotechnologies; draws attention to the fact that, in order to enjoy possible economies of scale, and owing to its interdisciplinary and complex nature, the infrastructure for R&D in nanotechnologies calls for a critical mass of resources that are beyond the means of local governments and industry; recognises, on the other hand, that smaller-scale national R&D policies may often be in a better position to react adequately to changing opportunities and market developments; therefore, urges the Commission and the Member States to reinforce and coordinate their R&D efforts in this field; to this end, recommends, in each Member State and in accordance with each country’s characteristics, the creation of a minimum critical mass of infrastructure and scientists with specific expertise in nanosciences and nanotechnologies, leading ultimately to the creation of specialised centres of excellence in some countries which would be coordinated at EU level;

7. Draws particular attention to nanomedicine as a promising interdisciplinary domain with breakthrough technologies such as molecular imaging and diagnostics, which can offer impressive benefits for the early diagnosis and smart and cost-effective treatment of diseases such as cancer, cardiovascular problems, diabetes, Alzheimer's and Parkinson's; urges the Commission and national and regional authorities to boost their R&D investments in this domain and to coordinate their efforts by means of the Nanomedicine European Technology Platform proposed in the Seventh Framework Programme for research, technological development and demonstration activities (Seventh Framework

Programme), and by means of other instruments, including the Regions of Knowledge proposed in the Seventh Framework Programme, so as to achieve critical mass in this field;

8. Stresses the major role to be played by nanosciences and nanotechnologies in developing molecular biology;

9. Is convinced that multidisciplinary nanosciences and nanotechnologies should be geared to the development of hydrogen energy, including the development of new and effective means of storing hydrogen and efficient fuel cells, as well as information-carrying technologies with much greater capacity than at present;

10. Stresses the considerable progress made in Europe in the field of nanotechnologies, based on a top-down approach, particularly in areas such as nanocomposites, abrasion – and corrosion – proof coatings and layers, and also the production of catalysers and photodiodes, including the so-called blue laser, as well as in the field of nanomedicine, nanocosmetics and nanodiagnosis of diseases;

11. Believes that the level of basic European research can make it possible to find technological tools that will enable a bottom-up approach to be adopted, particularly in nanoelectronics;

12. Believes that actions to accelerate technology development must be complemented by policy measures to ensure the market penetration of existing technologies; notes that standards can provide a level playing field for markets and international trade and are prerequisites for fair competition, comparative risk assessments and regulatory measures; calls therefore on the Commission and the Council to remove any barriers in the form of absent standards or unclear legislation, which unnecessarily hold back the adoption of nanotechnologies and nanosciences in Europe, and to do so without imposing any new bureaucratic hurdles;

13. Stresses the importance of generating the 'triangle of knowledge' (i.e. education,. research and innovation) needed for the European Research Area; considers that in order to achieve the necessary synergy between research, education and innovation, a comprehensive knowledge transfer approach, and also the development of cross-sector human resources, are needed; calls therefore on Member States to develop strategies to improve knowledge transfer and to address the skills shortage by increased emphasis on natural science training and by attracting more students into nanoscience and science-related, multidisciplinary subjects; welcomes the Commission’s effort to support research training networks in nanotechnologies and calls on the Member States to create, both in isolation and in close cooperation with each other, multidisciplinary networks to combine nanotechnologies with a broad spectrum of research areas, with the aim of developing new hybrid technologies;

14. Considers that industry, research institutes and financial institutions should work together to ensure that excellent R&D in nanosciences and nanotechnologies is translated into new products and processes; believes that Member States should accelerate and stimulate this process by focussing on improving the business climate for companies in the nanotechnology sector in their country, especially start ups, SMEs and innovative companies; considers, in this regard, that the protection of intellectual property rights is

essential for innovation, in terms both of attracting initial investment and of ensuring future revenue; calls on the Commission to develop standards for the protection of intellectual property rights and models for licensing agreements;

15 Regrets the fact that the patenting of nanoscience and nanotechnology inventions in Europe is developing slowly; calls on the EU to create a nanoscience and nanotechnology patent monitoring system governed by the European Patent Office;

16. Encourages general reforms in the field of the European patent system in order to cut the costs of patenting and to improve accessibility to patents for SMEs; stresses the need for greater transparency and clear limits to the scope of patent protection;

17. Is convinced that Europe's chances of being and staying at the forefront in this field hinge upon its capacity for coordination; reiterates the need for a single Community focal point for coordination and the importance of the EU's speaking with one voice on the international stage, particularly in the light of the challenges presented by patent protection in China; calls therefore on the Commission and Members States to devise mechanisms to effectively coordinate actions in this field; urges the Commission to take into account in its policy making all activities within the OECD (e.g. definitions, nomenclature, risk management) and UNESCO (ethics);

18. Recognises that an essential element of a responsible strategy is the integration of social, health and safety aspects into the technological development of nanosciences and nanotechnologies; in this regard, urges the Commission, the Member States and European industry to engage in an effective dialogue with all stakeholders, so as to steer developments along a sustainable path;

19. Stresses that the technological risks posed (from conception to disposal or recycling) to human health, consumers, workers and the environment must be assessed throughout the life cycle of nanoscience and nanotechnology products;

20. Recommends that lists of ingredients in consumer products identify the addition of manufactured nanoparticulate material;

21. Emphasises the need to respect high ethical principles and welcomes the planned reviews on issues such as non-therapeutic human enhancement and links between nanosciences and nanotechnologies and individual privacy; expects the reviews to be public and to include a thorough analysis of nanomedicine;

22. Supports the setting up of ethical committees which, by providing independent scientific advice, will help ensure that the public is properly informed and help create a climate of trust based on awareness of the possible risks and benefits associated with the use of discoveries in the field of nanotechnologies;

23. Welcomes the consultation conducted for this proposal and encourages the Commission to continue improving its work in order to respond to the increasing demand for better regulation;

24. Welcomes the intention of the Commission to develop appropriate multilingual information material for different age groups in order to raise awareness of the progress and expected benefits of nanosciences and nanotechnologies; encourages the

Commission to do so in close collaboration with Member States; urges the Commission to devise a communications strategy to raise the public's awareness of the enormous opportunities offered by nanotechnology, and to allay their fears; considers that, as part of this communications strategy, the Commission should also make use of ideas such as a roadshow (featuring a 'Nanoscience Truck') or a nanotechnology award;

25. Calls on industry to share in the joint effort and urges it to participate in developing nanotechnologies, taking into account their wider economic, societal, health, safety and environmental effects and acting in accordance with the principles of corporate social responsibility; in this regard, stresses that businesses should help disseminate objective information about scientific discoveries in the nanoscience and nanotechnologies field, about their intended uses, their risks and benefits for society;

26. Emphasises that all applications and uses of nanosciences and nanotechnologies must comply with the high level of protection of human health, consumers, workers and the environment prescribed by the EU and insists on the need for the codification of nanomaterials, which lead to the drawing up of standards, which would in turn boost efforts to identify any risks; calls on the Commission to take the necessary initiatives to this end;

27. Emphasises the importance of the miniaturisation of products with regard to helping reduce waste and ensuring better use of energy;

28. Emphasises that understanding of the potential damage to health and the environment of new, synthetic nanoparticles is still limited and that, consequently, the effects of nanoparticles that are not readily soluble or biodegradable should be investigated, in accordance with the precautionary principle, before such particles are put into production and placed on the market;

29. Calls on the Commission to pay special attention to the development of nanosciences and nanotechnologies in the new Member States, by providing them with the means to define research profiles of their own, while at the same time further enhancing the cutting-edge position of the main European locations with a view to creating a leading global role for Europe;

30. Stresses the importance of international cooperation in the field of nanosciences and nanotechnologies; calls on the Commission to intensify further the already excellent relations with Russian scientists in particular and to investigate the possibilities and limitations of cooperation in this area with the USA, Japan, China and India; calls on the Commission to enhance international cooperation with a view to harmonising nanoscience and nanotechnology patent application processing between the EU, the USA and Japan; stresses that dialogue should be intensified in compliance with the WTO obligations;

31. Instructs its President to forward this resolution to the Council and Commission, and to the governments and parliaments of the Member States.