POSITION STATEMENT

NANOTECHNOLOGY RESEARCH & DEVELOPMENT

Adopted by the IEEE-USA
Board of Directors, 24 June 2011

IEEE-USA supports the research, development and commercialization of nanotechnology. Nanotechnology, the research and development of materials, structures, and systems at the nanometer scale, with their novel properties is an enabling technology that will positively affect all areas of the American economy, quality of life, and will help America maintain its technological leadership. Nanotechnology is leading to significant advances in electronics, defense and homeland security, agriculture, communication, biology, diagnostic medicine, structural materials, and many other areas of prospective application in the next decade.

IEEE-USA strongly supports government policies that promote nanotechnology research and development and provide related support for commercialization and workforce education. To ensure the growth of nanotechnology and its economic benefits in the United States, the IEEE-USA further recommends that Congress and the Executive Branch:

- Authorize continued and stable funding for the National Nanotechnology Initiative (NNI). The NNI is already providing a strong foundation for nanotechnology research and development in the United States. The government should continue to encourage and enhance cross-agency and multidisciplinary collaboration.

- Encourage and support nanotechnology-related technology transfer programs. The government should encourage and promote the rapid transfer of research results to technology development. The government should promote the collaboration among federal laboratories, universities and industry to foster an environment for rapid application of nanotechnology. (For example, the National Science Foundation, Department of Energy, or Department of Defense nanotechnology-linked facilities should be made accessible to industry and universities.)

- Provide incentives for commercialization. Government incentives should be implemented to facilitate the timely commercialization of nanotechnology from the research laboratories to the marketplace. The timeliness of patent issues is important in the global competition.

IEEE-USA, 2001 L Street, NW, Suite 700, Washington, D.C. 20036-4910 USA
Office: +1 202 785 0017 ■ Fax: +1 202 785 0835 ■ E-mail: ieeeusa@ieee.org ■ Web: http://www.ieeeusa.org

- Facilitate development and implementation of nanotechnology standards. To maintain U.S. leadership in nanotechnology, it is imperative for the U.S. Government, through its scientific arms, to drive not only the international standard measurement and nomenclature, but also lead the establishment of a program that guides researchers in developing quality methodologies to provide a fundamental understanding of the exact nature of the novel properties of the nanomaterials.

- Support nanotechnology education programs. To create and maintain an appropriate work force, the government should encourage and financially support the development of curricula and instruction for teaching and training in nanotechnology at all educational levels; and address the means of enhancing the level of teaching competence at the secondary and primary levels, regarding the nature of nanotechnology.

- Explore the societal and environmental implications of nanotechnology. Since nanotechnology has the potential to affect humans and the environment in ways that are not yet known, research must be sponsored to examine its impact to avoid unforeseen adverse consequences. Establishing a comprehensive and systematic approach to safety is urgently needed.

IEEE-USA also generally supports the recommendations outlined by the President's Committee of Advisors on Science and Technology for enhancing the federal National Nanotechnology Initiative (NNI) in their Third Assessment released in March 2010.

This statement was developed by the IEEE-USA Research and Development Policy Committee and represents the considered judgment of a group of U.S. IEEE members with expertise in the subject field. IEEE-USA advances the public good and promotes the careers and public-policy interests of the more than 210,000 engineers, scientists and allied professionals who are U.S. members of the IEEE. The positions taken by IEEE-USA do not necessarily reflect the views of the IEEE or its other organizational units.

Background

Launched in 2000, the National Nanotechnology Initiative (NNI) is a multi-agency program involving 13 federal agencies responsible for R&D and 12 other agencies responsible for health, safety, environmental regulation, education, training, intellectual property protection, international relations and other areas that affect nanotechnology generally . The NNI is coordinated within the White House through the National Science and Technology Council (NSTC) Nanoscale Science, Engineering, and Technology (NSET) subcommittee.

Over 96 percent of the national nanotechnology-related R&D funding is concentrated in the six original NNI departments and agencies – the National Science Foundation, the Department of Defense, the Department of Energy, the National Institute of Standards and Technology, the National Aeronautics and Space Administration, and the National Institutes of Health. NNI research is focused into seven component areas, comprising fundamental phenomena and processes, nanomaterials, nanoscale devices and systems, instrumentation research, metrology and standards, research facilities and instrumentation acquisition, and the societal dimensions of nanotechnology, including environmental health and safety as well as education and other social implications.

In its Third Assessment of the NNI program (March 2011) the President's Council of Advisors on Science and Technology concluded that "the NNI has had a catalytic and substantial impact on the field and should be continued." PCAST also concluded that "while the United States continues to lead in most areas, it has lost ground to foreign competitors based on several key metrics. Applicable metrics include the number of scientific publications, citations to published literature, patents, the amount of government and corporate spending, the number of nanotechnology centers and initiatives, the number of Ph.D. graduates, and the number of active companies."

References:

The National Nanotechnology Initiative: Research and Development Leading to a Revolution in Technology and Industry, Supplement to the President's FY 2012 Budget Request, National Science and Technology Council (February 2011). See:
http://www.nano.gov/sites/default/files/pub_resource/nni_2012_budget_supplement.pdf

Report to the President and Congress on the Third Assessment of the National Nanotechnology Initiative, President's Council of Advisors on Science and Technology (March 2010). See:
http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-nni-report.pdf