

Nanotechnology: An EPA Perspective

International Conference on Nanotechnology
Occupational and Environmental Health and Safety:
Research to Practice

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Overview

- 21st Century Nanotechnology Research and Development Act (NRDA)
- National Nanotechnology Initiative (NNI)
- EPA Activities in General
- EPA White Paper – Research/Science
- Current TSCA/Stewardship Activities
- OECD EHS Nanotechnology Activities

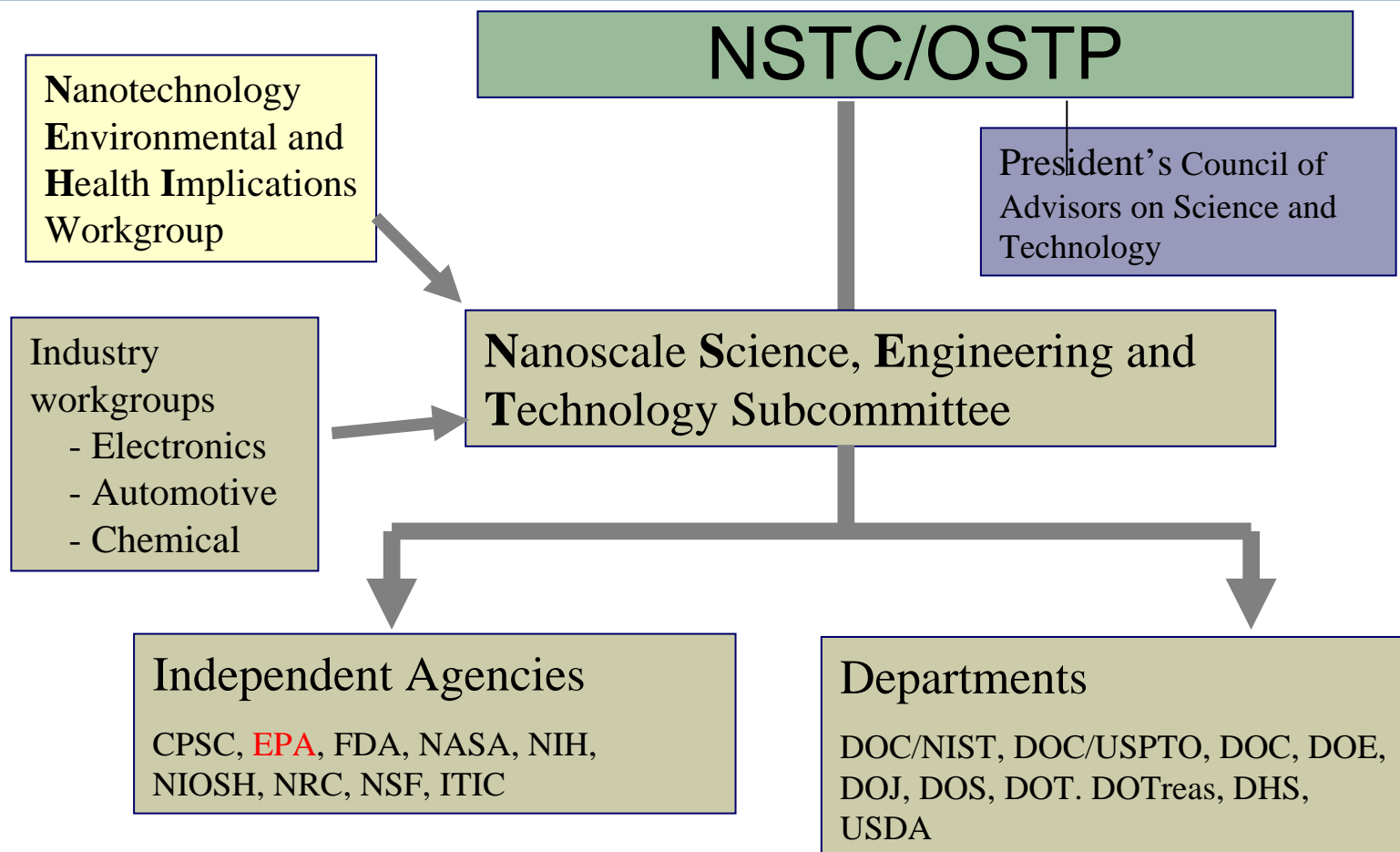


21st Century Nanotechnology Research and Development Act

- The NRDA resulted in implementation of the National Nanotechnology Initiative (NNI) to:
 - establish the goals and priorities for Federal nanotechnology R&D
 - invest in Federal R&D programs in nanotechnology to achieve those goals; and
 - provide for interagency coordination of Federal nanotechnology activities undertaken pursuant to NNI.
- The NRDA has added a policy backdrop to EPA's mission to protect human health and the environment



Federal Coordinating Structure for National Nanotech Initiative



Federal Nanotechnology R&D in the U.S. is coordinated by the NNI



NNI Goals

- Maintain a world class research and development program aimed at realizing the full potential of nanotechnology
- Facilitate the transfer of new technologies into products for economic growth, jobs and other public benefits
- Develop educational resources, a skilled workforce, and the supporting infrastructure and tools to advance nanotechnology and
- Support the **responsible development** of nanotechnology



Agency Activities

- EPA is increasingly engaged in nanotechnology scientific and policy issues – part of the NNI family
- ORD Grants and Research
 - Applications* – e.g., remediation and sensor products
 - Implications* – e.g., health and environmental safety research on nanoscale materials most likely to be found in commerce
- In 2004 the Science Policy Council (SPC) convened a cross-Agency workgroup to develop a white paper



Agency Activities (cont.)

- OAR -- reviewing an application under the CAA for registration of a diesel additive that claims to be nanosized cerium oxide.
- OPP -- receiving inquiries about nanoscale materials and is forming a workgroup to consider issues
- OSWER -- held a workshop July 2006 on nanotechnology and waste management practices
- OPPT – has received new chemical notifications and is working to implement TSCA in a way that encourages responsible development of nanotechnology



SPC: White Paper

- Science Policy Council (SPC): EPA's venue for discussion and management of cross-agency science issues
- Intra-agency Nanotechnology Workgroup convened by SPC (December 2004), co-chaired by ORD and OPPT and included input and review by all major EPA Offices
- Group charge: develop a white paper to examine the applications and implications of nanotechnology for the consideration of Agency managers
- Describes the potential environmental benefits of nanotechnology; identifies risk assessment issues and research needs; and provides recommendations for next steps.
- Draft released in December 2005
- External peer-review/Public Comment (19-20 April 2006)
- Approved by the SPC in September 2006
- Being finalized; publication expected in early 2007



White Paper Draft Recommendation Areas

- Pollution Prevention and Stewardship
- Research
 - Chemical identification and characterization
 - Environmental fate
 - Environmental detection and analysis
 - Potential releases and human exposures
 - Human health effects assessment
 - Ecological effects assessment
- Risk Assessment
- Cross-Agency Workgroup
- Collaboration
- Training



Nanoscale Materials and TSCA

- TSCA provides oversight of the manufacture and use of new and existing “chemical substances,” which include many nanoscale materials (NMs).
- New Chemicals Program:
 - NMs not on the TSCA Inventory are “new chemicals”
 - Notification is required before manufacture of “new chemicals”
 - EPA/OPPT has identified only one pre-manufacture notice (PMN) that has met all three elements of the NNI definition of “nanotechnology”.
- Existing Chemicals Program:
 - NMs that are existing chemicals, i.e. already on the TSCA Inventory, are subject to TSCA existing chemical authorities
 - EPA needs information on use, hazard, exposure and risk information on NMs to make informed decisions



TSCA Approach

- Comprehensive NMs Program that:
 - Encourages responsible development of NMs
 - Includes regulatory and stewardship components



Stewardship Program Elements

- Encourage submission of information from producers of nanoscale materials
- Encourage development of additional test data needed to establish a sound scientific basis for decision making
- Identify and encourage use of risk management practices



Nanoscale Materials Stewardship Program

- **Collaborative Program Design**
- Release EPA documents for comment and discussion at public meetings, including:
 - General Approach of TSCA Oversight for Nanoscale Materials;
 - TSCA Inventory Status of Nanoscale Materials (clarifying new v. existing chemical NMs);
 - Concept for a Stewardship Program- general approach, issues, and considerations; and
 - Proposed Information Collection Request (ICR) - based on EPA experience with Premanufacture Notification in the TSCA New Chemicals Program



Nanoscale Materials Stewardship Program

- **Collaborative Program Design – Cont'd**
 - Public scientific peer consultations on key elements of Stewardship Program
 - Consultation on risk management practices held October 19-20, 2006 (OSHA and NIOSH were on peer panel)
 - Consultation on NM characterization planned for early 2007
 - Consider comments/input and work towards finalizing approach in 2007
- **Stewardship Program Implementation**
 - EPA anticipates a possible approach with both basic and in-depth levels of commitment by companies and/or consortia



OECD Working Party on Manufactured Nanomaterials (1)

- Met in London, October 26-27, 2006.
- Working Party agreed to Programme of Work
 - **Objective:** *promote international cooperation in human health and environmental safety related aspects of manufactured nanomaterials*
 - **Three work areas:**
 - Identification, characterization, definitions, terminology and standards
 - Testing methods and risk assessment
 - Information sharing, co-operation and dissemination
- Programme of Work was approved by the Chemicals Committee on 15-17 November 2006
- Next Working Party meeting, April 2007 in Germany



OECD Working Party on Manufactured Nanomaterials (2)

- The Working Party also agreed to advance its work over the near term by establishing small groups to advance certain specific projects:
 1. Development of an OECD Research Technologies Database
 2. Environmental Health and Safety Research Strategies on Manufactured Nanomaterials
 3. Safety Testing of a Representative Set of Manufactured Nanomaterials
 4. Manufactured Nanomaterials and Test Guidelines
 5. Co-operation on Voluntary Schemes and Regulatory Programmes
 6. Co-operation on Risk Assessments and Exposure Measurements



For More Information

NNI: <http://www.nano.gov/>

EPA/OPPT: <http://www.epa.gov/oppt/nano/>

EPA/ORD: <http://www.epa.gov/osa/nanotech.htm>

OECD: <http://www.oecd.org>