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OECD Conference on Potential Environmental Benefits of Nanotechnology: Fostering Safe Innovation-Led Growth

Policy Considerations for an Integrated Policy Framework

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Key Messages

- Vigorously continue initiatives to address science and governance uncertainties, including:
 - Focused and Prioritized R&D
 - Government Regulatory Measures (Mandatory/Voluntary)
 - Inter-Governmental Cooperative Efforts
 - Private-Sector Stewardship Initiatives
 - Standard-Setting Initiatives

Key Messages (cont'd)

- Develop more integrated science and policy frameworks to promote environmental benefits of nanotechnologies
- Enhance greatly engagement with the public to develop business and consumer confidence and ensure the innovation-led growth of nanotechnologies

U.S. Legal/Regulatory Governance Framework Initiatives

- General Approach -- Integrate nanotechnology into existing regulations, consider new authorities as necessary
- U.S. Environmental Protection Agency
 - Nanotechnology White Paper (<http://www.epa.gov/osa/pdfs/nanotech/epa-nanotechnology-whitepaper-0207.pdf>)
 - Nanoscale Materials Stewardship Program
 - Toxic Substances Control Act -- Regulatory Guidance; TSCA Significant New Use Rules (SNUR)
 - Federal Insecticide, Fungicide, and Rodenticide Act -- Regulatory Guidance; Response to International Center for Technology Assessment (ICTA) Petition

Private-Sector Stewardship Initiatives

- International Council on Nanotechnology (ICON) GoodNanoGuide (<http://goodnanoguide.org>)
- Environmental Defense Fund/DuPont Nano Risk Framework (<http://nanoriskframework.com>)
- Nanotechnology Occupational Safety and Health (NOSH) Consortium
- Responsible NanoCode (<http://www.responsiblenanocode.org>)

Inter-Governmental Cooperative Initiatives

- Organization for Economic Cooperation and Development (OECD)
 - Working Party on Manufactured Nanomaterials (WPMN) (Chemicals Committee)
 - Working Party on Nanotechnology (WPN) (Committee for Scientific and Technological Policy)
- UNESCO Ethics of Science and Technology Programme, COMEST -- Considers ethical issues associated with science and technology and prepared the Ethics and Politics of Nanotechnology (2006)
- Intergovernmental Forum on Chemical Safety (IFCS) -- Issued in 2008 “Dakar Statement on Manufactured Nanomaterials”
- UNEP International Conference on Chemicals Management (ICCM) Strategic Approach to International Chemicals Management (SAICM) -- In May 2009, considered nano issues

Standard-Setting Initiatives

- International Organization for Standardization (ISO)
 - Technical Committee 229 -- Four Nanotechnology Subcommittees: Terminology and Nomenclature; Measurement and Characterization; Health, Safety, and Environmental Aspects; and Material Specifications
- ASTM
 - Technical Committee E56 on Nanotechnology -- Addresses issues on standards and prepares guidance materials on nanotechnology and nanomaterials
- Close coordination with other standard-setting organizations and entities -- International Electrotechnology Committee (IEC/TC113), NIST, among others

Challenges for Effective Policy Development

- **Accommodating high expectations** regarding economic growth, while addressing effectively knowledge gaps and governance uncertainties
- **Addressing the significant technical** challenges inherent in nanotechnologies
 - Diversity and pervasiveness of scientific/technological fields
 - Corresponding diversity of the implications of nanotechnology applications
 - Evolving nature of monitoring, detection, risk assessment tools and methodologies
- **Navigating a legal/regulatory framework** that is rooted in end-of-pipe treatment and control, as opposed to pollution prevention/product life cycle thinking
- **Addressing public perception** and ethical considerations

Fostering Effective Policy Development

Understand Your Role

- **Understand Your Role in the Process**
 - **Academic Community** -- Expand research in areas addressing key scientific uncertainties, identify/prioritize research needed to support regulatory decision-making
 - **Business Community** -- Support public-private partnerships and related research efforts; engage more actively in dialogue with public on implications of nanotechnologies; develop and pursue strong and innovative product stewardship programs

Fostering Effective Policy Development

Understand Your Role (cont'd)

- **NGO Community** -- Continue to press for change, highlight deficiencies in status quo; propose innovative solutions to address uncertainties; expand consideration of environmental benefits (July 2009, updated earlier EWG conclusion that certain nano-based sunscreens are safer and more effective than other commercially available sunscreen options)
- **Legal/Regulatory Community** -- Strive to research use of existing authorities in creative, defensible ways; educate clients and others on emerging legal issues; seek to promote the responsible development of nanotechnology

Fostering Effective Policy Development Science/Analytical Tools

- Adapt traditional risk assessment/risk management tools to emerging technologies
- Apply life cycle assessment tools/methodologies to nanomaterials and nanoproducts to inform policy decisions at multiple levels
 - Develop and standardize tools to identify measurable impacts (ISO 14040, 14044 and SETAC's LCA framework apply)
 - Develop reliable inventory of input/output data and characterization metrics applicable to nanomaterials
 - Develop approaches to quantify risks and benefits to assess net environmental benefits and inform trade-off determinations
 - Address CBI issues on manufacturing processes, process-to-process variation, lack of tox test data, related issues

Fostering Effective Policy Development

Policy Tools

- Existing Laws/Regulations/Policies -- Assess utility and need for change
- Legislative Opportunities
 - Enhanced R&D funding (NNI Reauthorization, Green Chemistry Legislation, Appropriations)
 - Incentive legislation -- “Cap and trade,” other flexible legislative/regulatory approaches
- Economic Incentives -- Reward positive behavior
 - Subsidies
 - Tax relief
 - Leverage the power of federal procurement (RCRA Comprehensive Procurement Guidelines (CPG) for recycled goods, biobased product preferences)
 - Government enforcement discretion opportunities

Fostering Effective Policy Development Public Discourse

- Traditional Media
- Non-Traditional Media (blogs, Internet-based communication platforms)
- Public Dialogues (Nanologue, Nano Risk Framework, GoodNanoGuide, NIOSH Information Exchange)
- Public Conferences/Meetings -- Government-initiated or third-party initiated
- Regulatory Process -- Traditional “notice and comment” opportunities
- Social Marketing -- Product labeling (consider collaborative industry/government/NGO voluntary labeling)

Fostering Effective Policy Development International Cooperation

- Technology is global and strong international cooperation is essential to ensure oversight is appropriate
- Focused global research and regulatory/standardization must be globally aligned to maximize efficiency and avoid unnecessary impediments
- International cooperation is needed to engage the public in a constructive dialogue on nanotechnologies and other emerging technologies

Conclusion

- Enabling emerging technologies requires innovation and an integrated approach to the oversight of legal/regulatory, stewardship, and national and international collaborative efforts
- All stakeholders need to step-up and think creatively together

Thank You

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