

Overview of the 2014 NNI EHS Progress Review

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Consumer Product Safety Commission (CPSC)

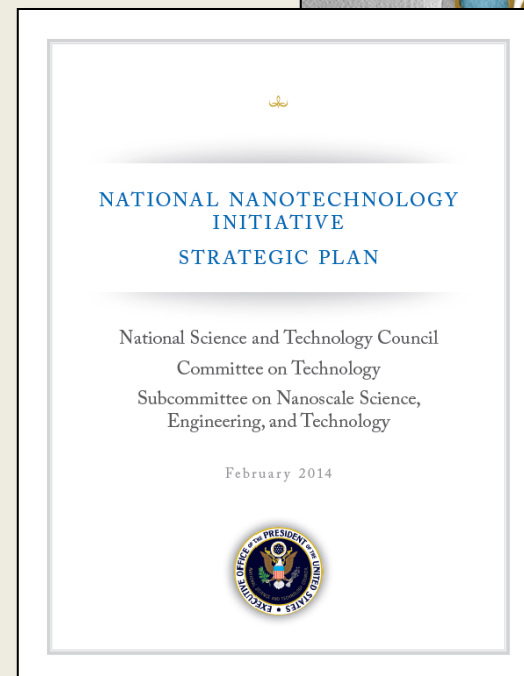
Co-Chair of the Nanotechnology Environmental and Health
Implications Working Group

Nanoscale Science, Engineering, and Technology Subcommittee

National Nanotechnology Initiative (NNI)

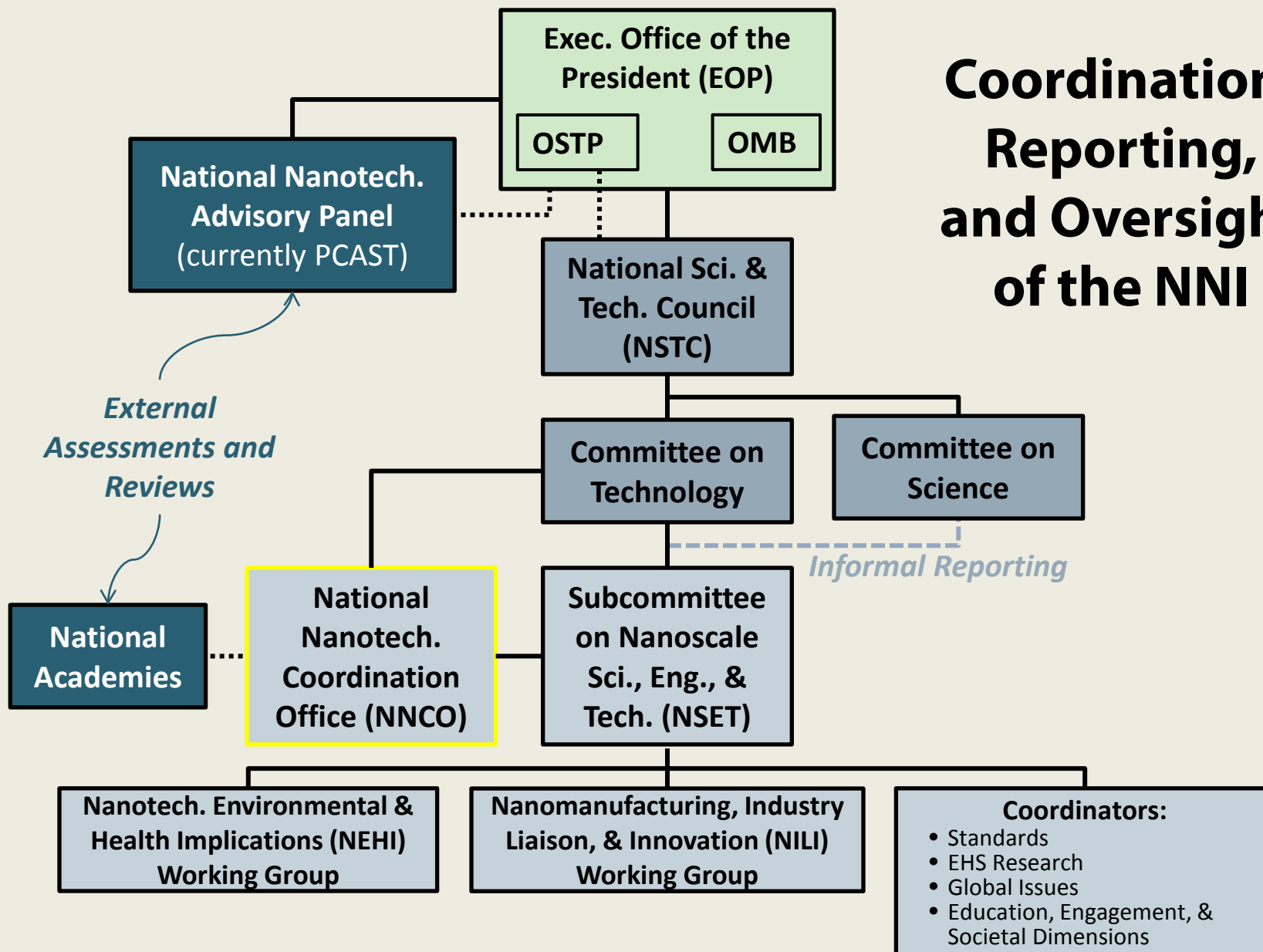
- Launched in 2000 to promote and coordinate US nanotech R&D
- Collaborative R&D to advance understanding and control of matter at the nanoscale for:
 - National economic benefit
 - National security
 - Improved quality of life
- 20 Federal Depts, Independent Agencies, and Commissions
 - 11 have specific nanotech budgets
- 2014 budget: \$1.5 billion
 - Cumulative \$20 billion investment since 2001

A coordinated initiative, NOT a distinct funding program.





Coordination, Reporting, and Oversight of the NNI



Federal Agencies Participating in NEHI

OSTP



OMB



CPSC



DOC/NIST



DOD



DOE



DOI/USGS



DOL/OSHA



DOS



EPA



HHS/ATSDR



HHS/CDC/NIOSH



HHS/FDA



HHS/NIH/NCI



HHS/NIH/NIEHS



ITC



NSF



USDA/FS

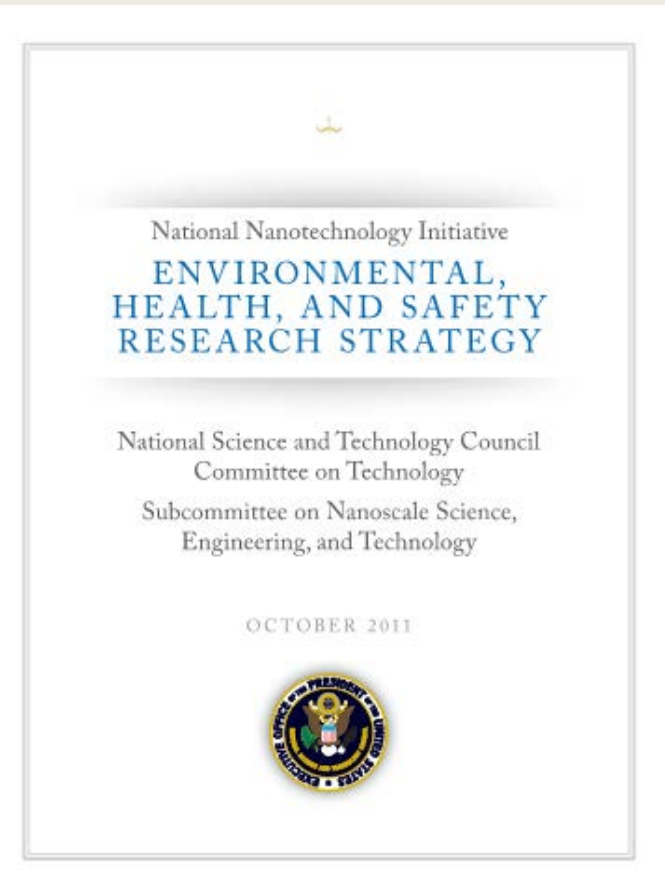


USDA/NIFA



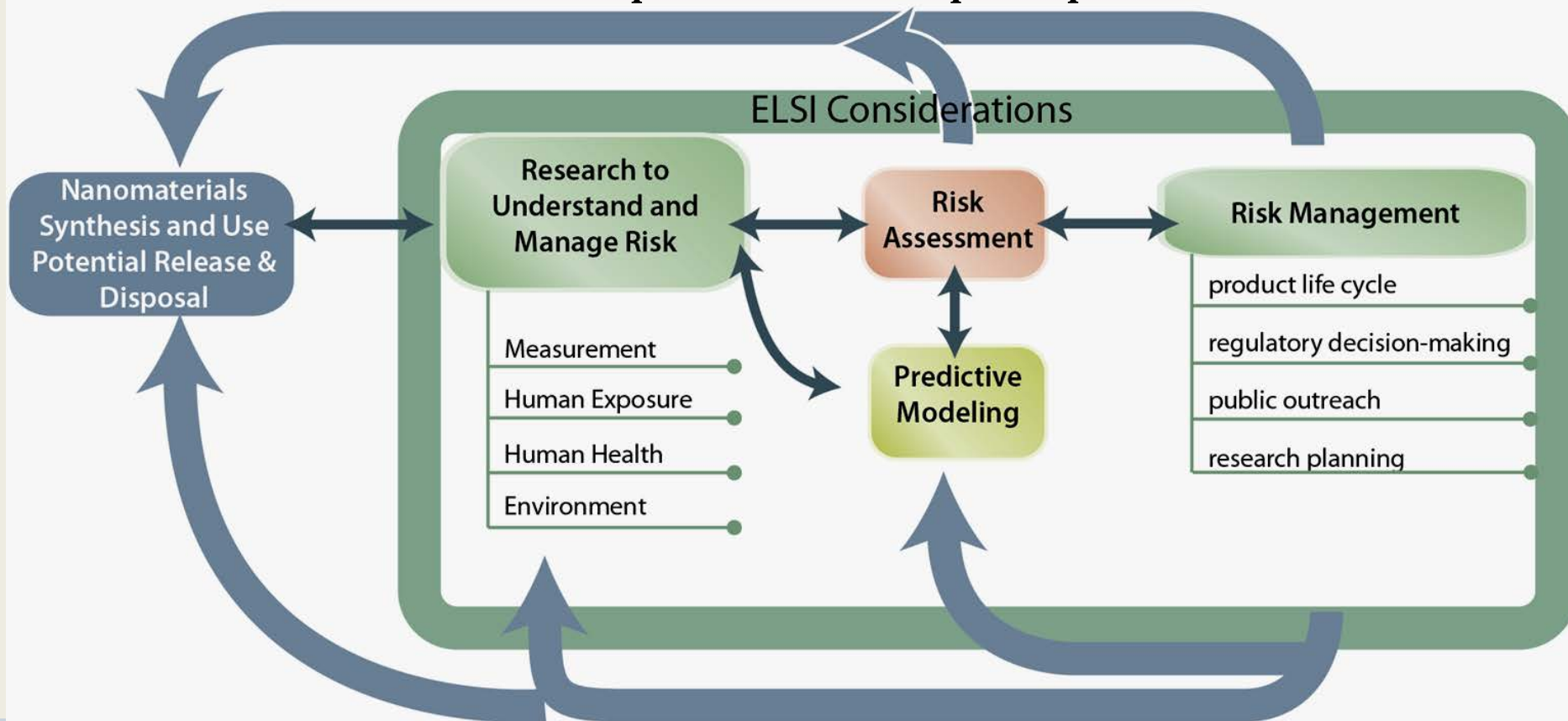
The 2011 NNI EHS Research Strategy

“A future in which responsible development of nanotechnology provides maximum benefit to the environment and to human social and economic well-being.”

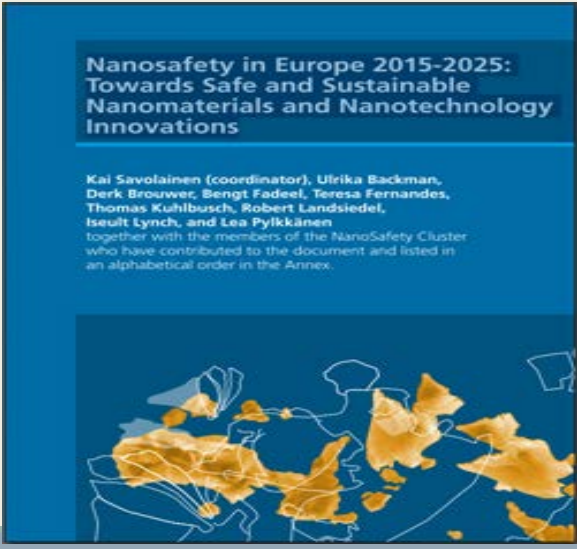
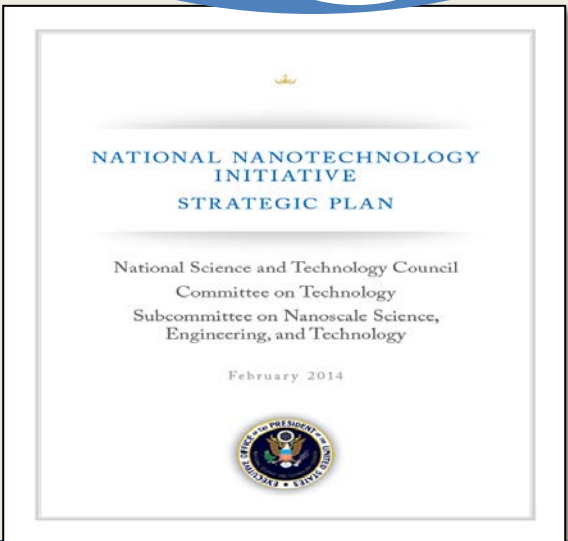
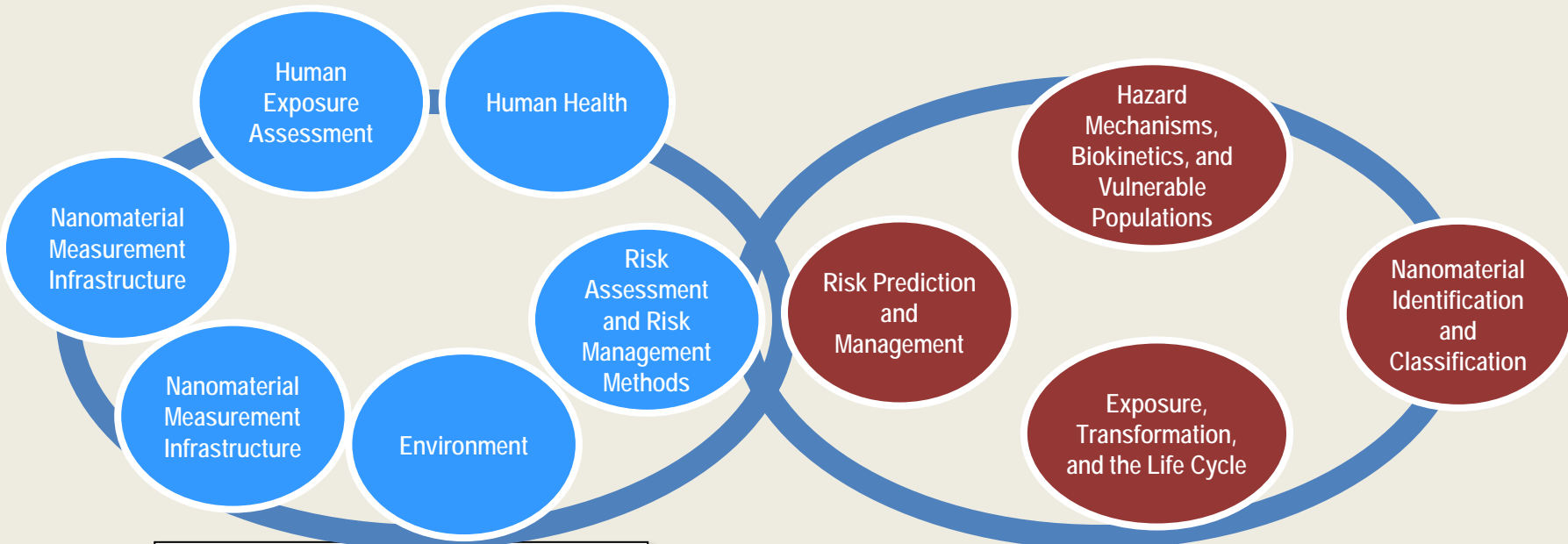


- Developed jointly by the NEHI agencies
- Consistent with the objectives of NNI Goal 4
- Identified six core research areas in nanotechnology-related environmental, health, and safety (nanoEHS)
- Identified specific research needs in each core research area
- Identified overarching activities for implementation and coordination of the Strategy

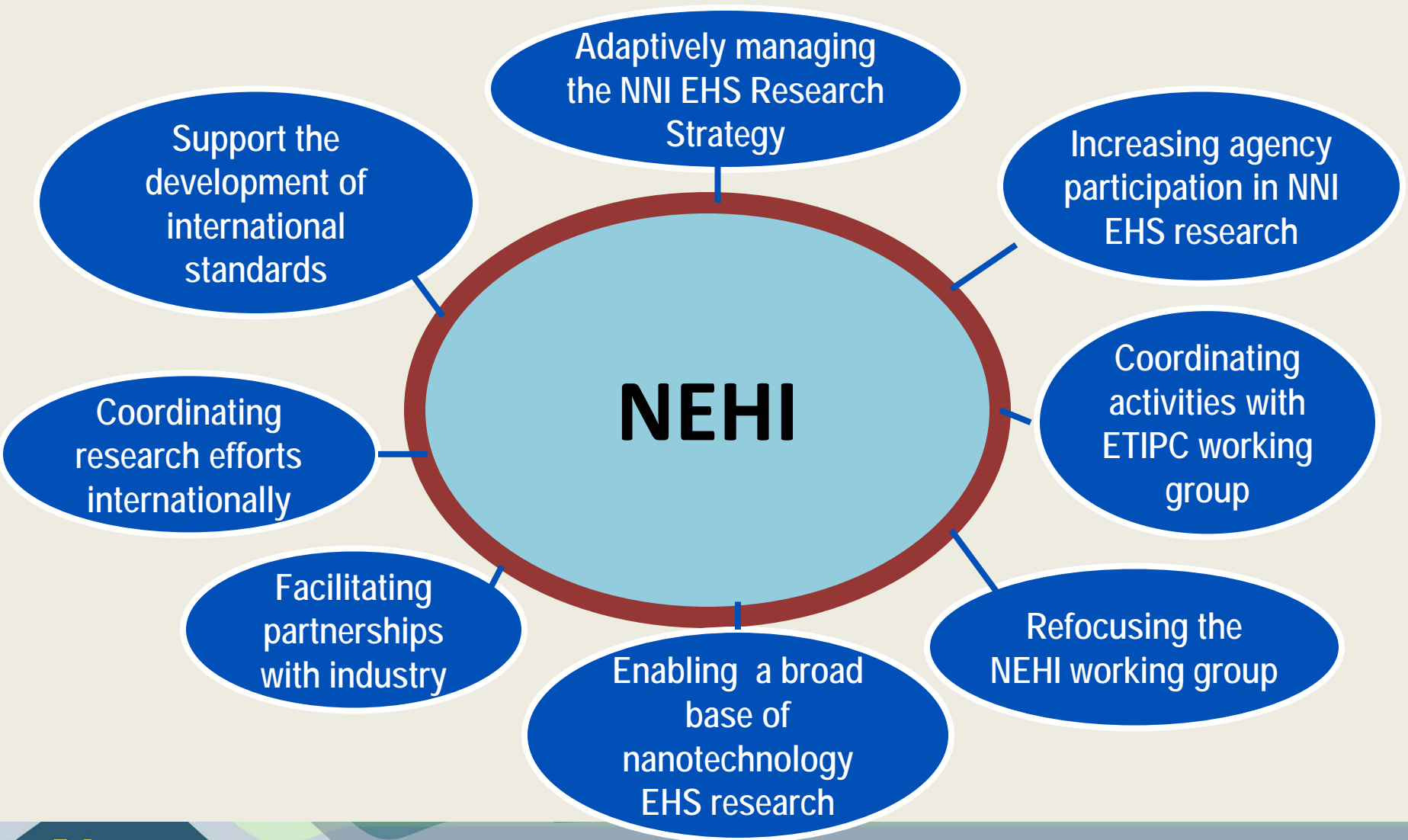
The 2011 NNI EHS Strategy: A conceptual framework that incorporates risk-assessment, risk management, and life cycle analysis to inform specific research principles



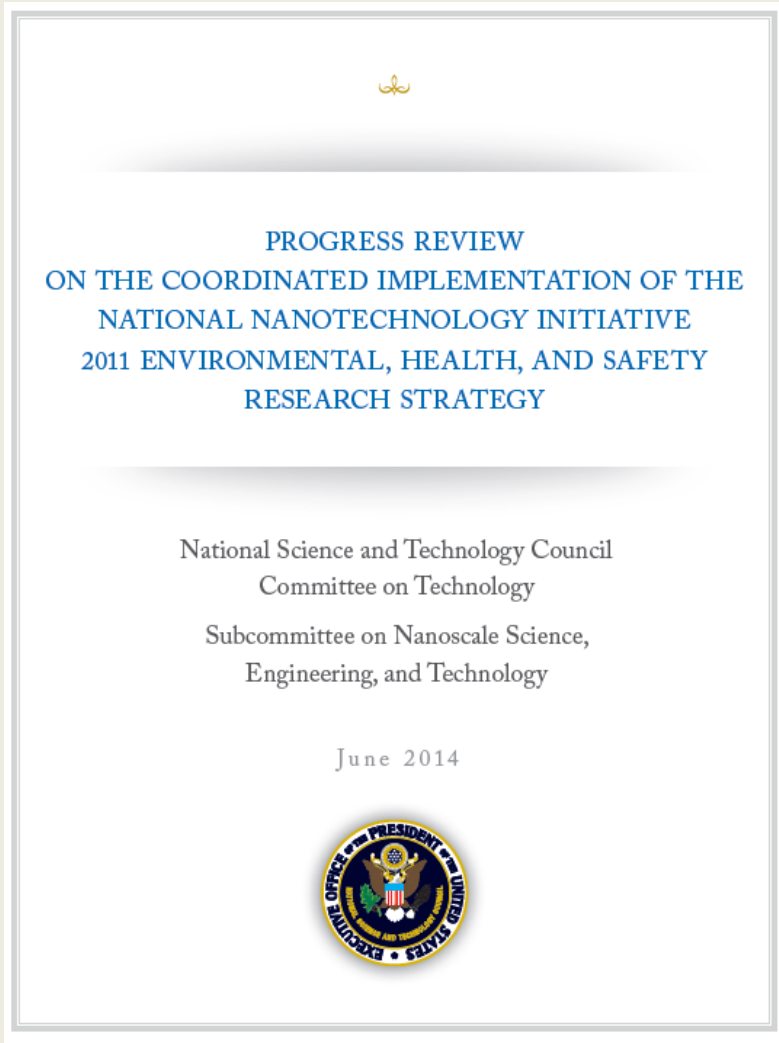
Common Research Questions



Implementation and Coordination of the Strategy



The 2014 NNI EHS Progress Review



- Developed jointly by the NEHI agencies
- Follows the structure of the 2011 NNI EHS Research Strategy
- Contains annotated examples of nanoEHS research activities undertaken by the NEHI agencies
- Includes intramural and extramural research from FY 2009 to FY 2012
- Demonstrates extensive coordination and collaboration among the NEHI agencies
- Is not a comprehensive review of all nanoEHS research supported by the Federal Government
- Is not a technical review of current state of progress in nanoEHS research

The 2014 NNI EHS Progress Review

Key Findings

- ✓ NEHI Agencies and grantees produced over 400 nanoEHS-related publications from FY2009 to FY2012
- ✓ Collaboration among Federal agencies through interagency agreements
- ✓ Collaboration with multi-stakeholder groups to assess the state of the science in key areas
- ✓ Support of international and voluntary standards development
- ✓ Support of university-based EHS research centers
- ✓ Federally funded databases and platforms for nano EHS information

Nanomaterial Measurement Infrastructure

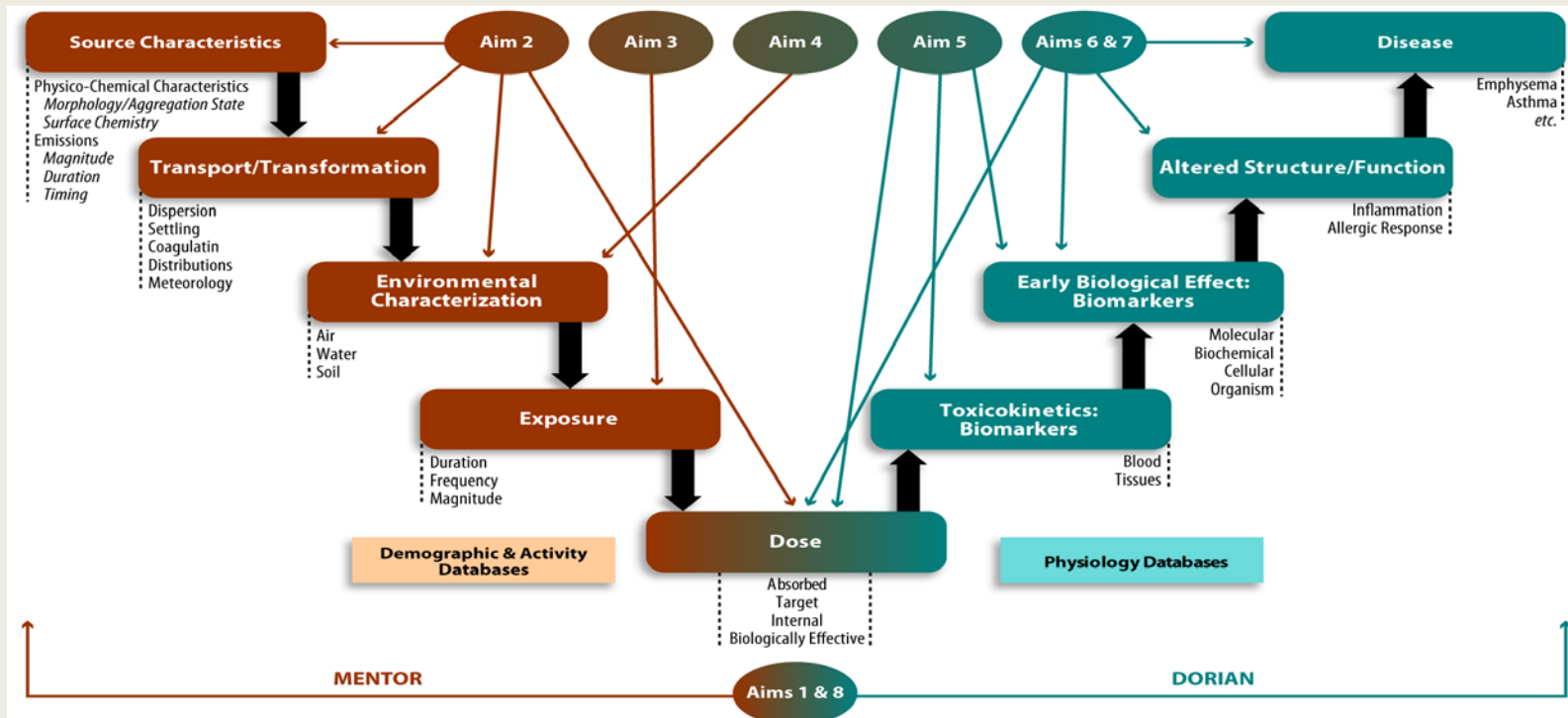
NEHI agencies partner with international multi-stakeholder groups

Example:

- Development of consensus standards with:
 - *ISO Technical Committee 229 on Nanotechnologies*
 - *ASTM International Technical Committee E56 on Nanotechnology*
- 15 published standards on physico-chemical property measurements of ENMs
- Other published standards on biological responses to ENMs



Risk Assessment and Risk Management Methods: Risk Assessment for Manufactured Nanoparticles Used in Consumer Products (RAMNUC) framework and aims *EPA, CPSC, and UK*

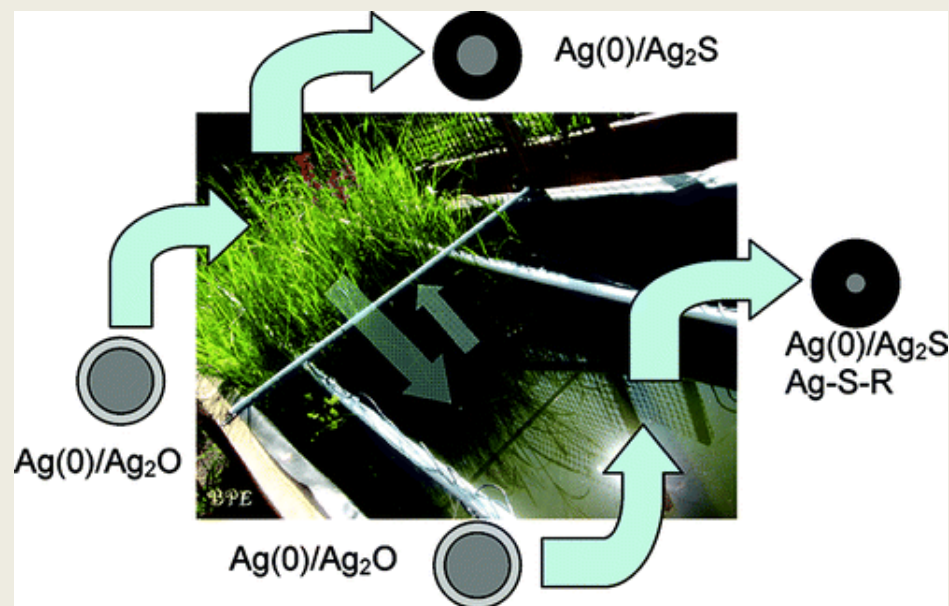


Environment

Some of the NEHI agencies provide funding for university-based centers

Example:

- NSF and EPA established two centers for the environmental implications of nanotechnology: CEINT, led by Duke University and CEIN, led by UCLA
- Research to identify the factors that control stability and mobility of ENMs in aqueous, atmospheric, and land ecosystems



Source: G. V. Lowry et al., Long-term transformation and fate of manufactured Ag nanoparticles in a simulated large scale freshwater emergent wetland, *Environ. Sci. Technol.* **46**, 7027–7036 (2012).

Predictive Modeling and Informatics

NEHI agencies coordinate in the development of new multi-agency research thrust areas

Example:

- The Nanotechnology Knowledge Infrastructure (NKI)
Nanotechnology Signature Initiative (NSI)
- Provide a community-based, solutions-oriented knowledge infrastructure to accelerate nanotechnology discovery and innovation



Some organizations and efforts that support the NKI

Source: Nanotechnology Signature Initiative: Nanotechnology Knowledge Infrastructure: enabling national leadership in sustainable design, <http://www.nano.gov/NSINKI>; accessed 5 March 2015.

Risk Assessment and Management

NEHI agencies coordinate and participate in public outreach activities

Example:

- 2013 NNI workshop on the *Perception, Assessment, and Management of the Potential Risks of Nanotechnology*
- Attendees from U.S. industry, government agencies, and academic and not-for-profit organizations
- Communicate information on the potential risks of nanotechnology to the public
- Inform NEHI agency research



Source: Adapted from "Stakeholder perspectives on the perception, assessment, and management of the potential risks of nanotechnology," <http://www.nano.gov/R3Workshop>; accessed March 5, 2015.

Some Benefits of the Progress Review

- *Enhanced communication* of research activities among the NEHI Working Group's member agencies
- Identification of *synergistic ongoing and planned activities* as well as potential *research gaps* that can lead to new interagency collaborations and leveraging of existing agency resources
- Informed guidance to the NEHI participating agencies in the formulation of their *own intramural and extramural research portfolios and allocation of their resources*, in the context of their agency-specific missions
- Integrated development of potential *new interagency initiatives or thrust areas* that can provide opportunities for enhancing and optimizing agency investments
- *Communication with myriad stakeholders* about agency research accomplishments and priorities and about agency implementation and coordination of the 2011 NNI EHS Research Strategy
- Identification of opportunities for stakeholders *to participate in or leverage ongoing or planned research* of the NEHI agencies

Exposure Assessment - State of the Science?

Quantifying Exposure to Engineered Nanomaterials (QEEN) from Manufactured Products *Addressing Environmental, Health, and Safety Implications*

July 7-8, 2015 Washington, DC

- A technical workshop to determine the state of the science and the tools and methods available to characterize and quantify exposure to engineered nanomaterials from consumer products
- *Sponsored by the CPSC and co-hosted by the NNI*
- For additional information, please email QEENworkshop@nnco.nano.gov or visit Nano.gov/QEENworkshop

Important topics and questions

- What are the current testing methods and challenges unique to measuring exposure to manufactured nanomaterials from consumer products across the product life cycle?
- Are toxicity data relevant for the exposures experienced by population sub-groups?
- What is the importance of understanding NM characteristics, exposure route, uptake and disposition in the body?

THANK YOU!