



# An Overview of the NNI and its Evolution

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2013 NNI Workshop on Stakeholder Perspectives on the Perception, Assessment,  
and Management of the Potential Risks of Nanotechnology

Washington, DC

September 10, 2013

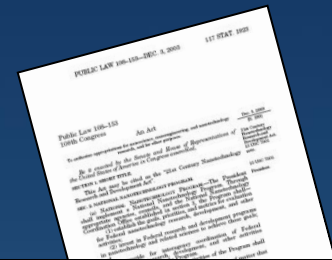
# The U.S. National Nanotechnology Initiative

## Vision:

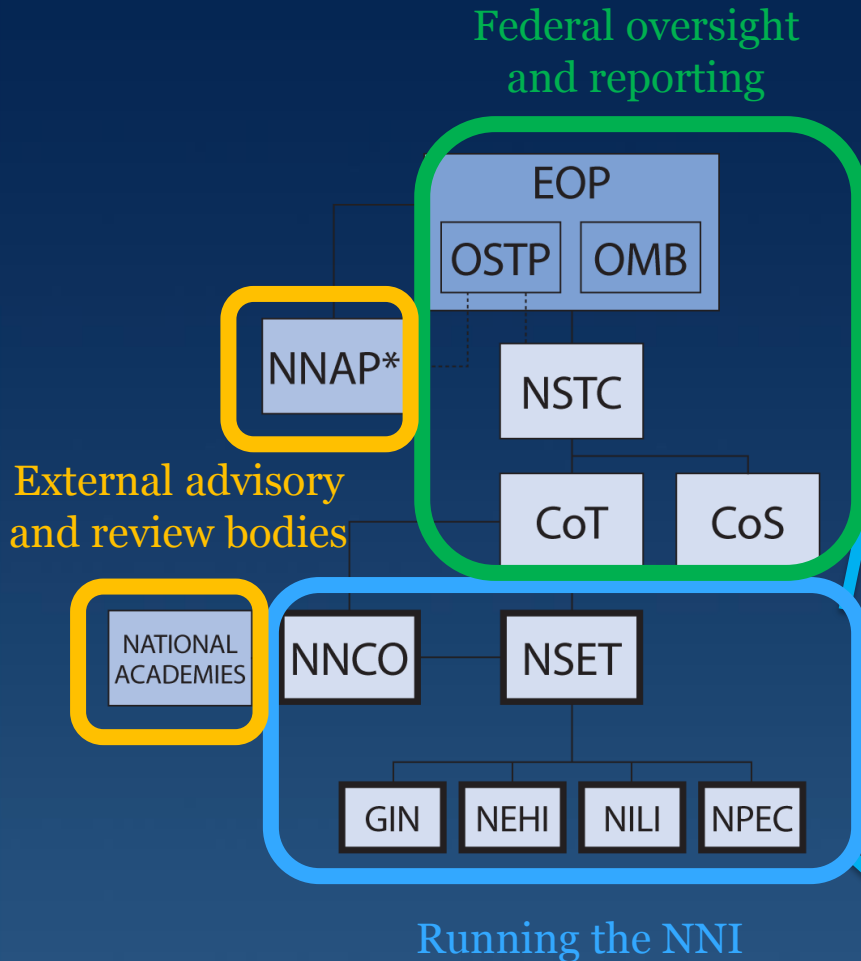
- A future in which the ability to understand and control matter at the nano-scale leads to a revolution in technology and industry that benefits society.

## Background:

- The NNI began in FY 2001 and its activities were codified and further defined in the 21st Century Nanotechnology Research and Development Act (December 2003)
- The NNI is a government *initiative*, representing a priority area for investment and activity, but not a distinct *funding program* with separate budget authority
- Total Federal investments now ~\$1.7 billion annually across 15 Federal department and agency units, with another 12 participating in the NNI



# NNI activities are coordinated via the National Science and Technology Council

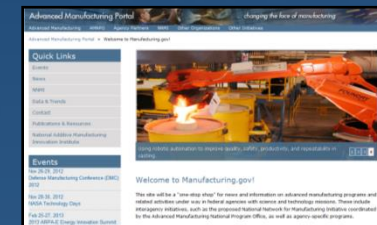
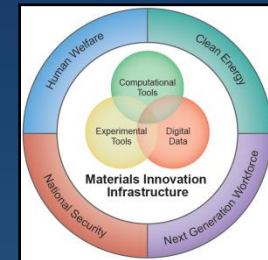
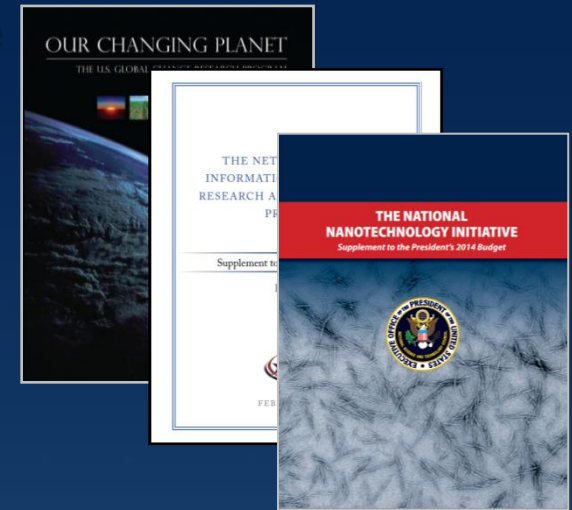


- **NSET** = Nanoscale Science, Engineering, and Technology Subcommittee of NSTC
- **NNCO** = National Nanotechnology Coordination Office
- **GIN** = Global Issues in Nanotechnology Working Group (WG)
- **NEHI** = Nanotechnology Environmental and Health Implications WG
- **NILI** = Nanomanufacturing, Industry Liaison, and Innovation WG
- **NPEC** = Nanotechnology Public Engagement and Communications WG



# The NNI remains a major administration priority - with responsible development as a top-level goal

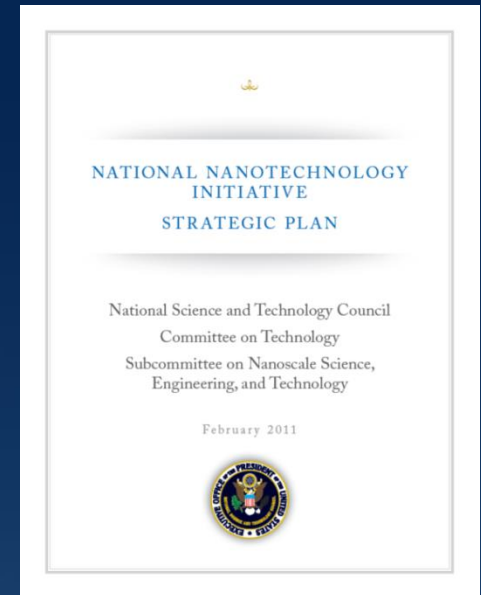
- Three major, ongoing interagency programs under the NSTC have standing National Coordination Offices
  - **Global Change Research Program (GCRP)**
    - since 1989, 13 agencies, ~\$2.5B
  - **Networking and Information Technology Research and Development (NITRD)**
    - since 1991, 16 agencies, ~\$3.8B
  - **National Nanotechnology Initiative (NNI)**
    - since 2001, 27 agencies, ~\$1.7B
- Other newer initiatives also connect to activities under the NNI, including:
  - **Materials Genome Initiative (MGI)**
    - note particularly the Nanotechnology Knowledge Infrastructure NSI, which focuses on data, informatics, and modeling and so contributes to both MGI and NNI
  - **Advanced Manufacturing**
    - note common interests with the Sustainable Nanomanufacturing NSI



# The NNI's triennial Strategic Plan, and overarching Goals

- Most recent NNI Strategic Plan of February, 2011 updated the prior strategic plans of 2007 and 2004
- Sets forth the four ongoing NNI goals:
  1. Advance a world-class nanotechnology research and development program
  2. Foster the transfer of new technologies into products for commercial and public benefit
  3. Develop and sustain educational resources, a skilled workforce, and the supporting infrastructure and tools to advance nanotechnology
  4. Support responsible development of nanotechnology

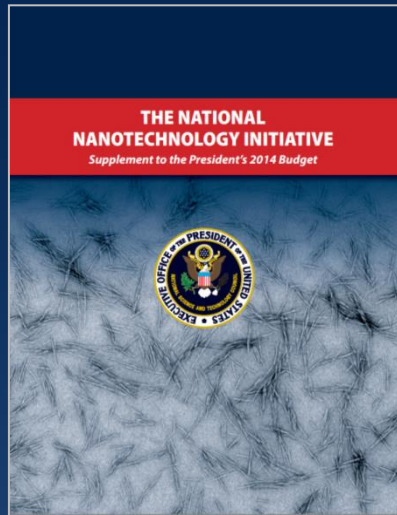
and provides information on specific objectives supporting them



- Describes Program Component Areas (PCAs), agency interests and priorities, coordination and assessment structures and mechanisms, collaborative agency activities and plans, and stakeholder input

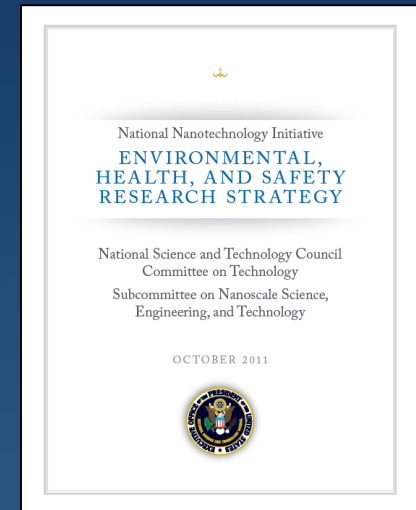


# Other core NNI documents: Annual Supplements to the President's Budget, and Environmental, Health, and Safety Research Strategy



- The annual budget supplements detail Federal nanotechnology investments and activities, and serve as the annual reports of the NNI
- Describe progress toward NNI goals and objectives, updates on Signature Initiatives, and related supporting information

- The 2011 NNI EHS Research Strategy serves as a comprehensive and more detailed follow-up to a prior initial strategy (2008) and identification of research needs (2006)
- Provides guidance to Federal agencies on research activities, priorities, and program planning



# The NNI's Nanotechnology Signature Initiatives

- Represent topical areas of national importance that may be more rapidly advanced through enhanced interagency coordination and focused investment.
- Are intended to be dynamic; topical areas will likely be added and evolve over time.

- Current portfolio of five NSIs:

- Sustainable **Nanomanufacturing** (launched 2010)
- **Nanoelectronics** for 2020 and Beyond (2010)
- Nanotechnology for **Solar Energy** Collection and Conversion (2010)
- Nanotechnology Knowledge Infrastructure (**nanoinformatics** +) (2012)
- Nanotechnology for **Sensors** and Sensors for Nanotechnology (2012)



NSI white papers can be accessed at:  
<http://nano.gov/signatureinitiatives>



# NNI evolution: agencies and budgets

## 2001

DHHS (NIH)  
DOC (NIST)  
DOD  
DOE  
DOT  
EPA  
NASA  
NSF

*\$464M*

## 2007

CPSC  
DHHS (FDA, NIH, NIOSH)  
DHS  
DOC (BIS, NIST, TA, USPTO)  
DOD  
DOE  
DOEd  
DOI (USGS)  
DOJ  
DOL  
DOS  
DOT  
DOTreas  
EPA  
ITC  
ITIC  
NASA  
NRC  
NSF  
USDA (CSREES, FS)

*\$1.424B*

## 2013

CPSC  
DHHS (FDA, NIH, NIOSH)  
DHS  
DNI (NRO)  
DOC (BIS, EDA, NIST, USPTO)  
DOD  
DOE  
DOEd  
DOI (USGS)  
DOJ  
DOL  
DOS  
DOT (FHWA)  
DOTreas  
EPA  
ITC  
NASA  
NRC  
NSF  
USDA (ARS, FS, NIFA)

*~\$1.6B*





# NNI evolution: management structure

## *organizational units and leadership*

2001

NSET Subcommittee  
- Chair (Agency)

NNCO  
- Director (part-time detailee)

2007

NSET Subcommittee  
- Co-Chair (Agency)  
- Co-Chair (OSTP)

Subordinate Working Groups  
(each with chair/co-chairs):  
- Global Issues in Nanotechnology (GIN)  
- Nanotechnology Environmental and Health Implications (NEHI)  
- Nanotechnology Innovation and Liaison with Industry (NILI)

NNCO  
- Director (full-time detailee)

2013

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- Nanotechnology Public Engagement and Communications (NPEC)

Topical Coordinators  
- Environmental, Health, and Safety Research  
- Standards

NNCO  
- Director (full-time Federal)  
- Deputy Director ( " )



# NNI evolution: investment reporting structure

2001

*Funding Themes / Investment Modes:*

Fundamental Research  
Grand Challenges

- Nanomaterials by design
- Nano-electronics, optoelectronics, and magnetics
- Healthcare
- Nanoscale processes and environment
- Energy
- Microspacecraft
- Bio-nanodevices for detection and mitigation of threats to humans
- Economical and safe transportation
- National security

Centers and Networks of Excellence  
Research infrastructure  
Societal Implications and Workforce

2007

*Program Component Areas:*

Fundamental nanoscale phenomena and processes  
Nanomaterials  
Nanoscale devices and systems  
Instrumentation research, metrology, and standards  
Nanomanufacturing  
Major research facilities and instrumentation acquisition  
Societal dimensions

2013

*Program Component Areas:*

Nanotechnology Signature Initiatives

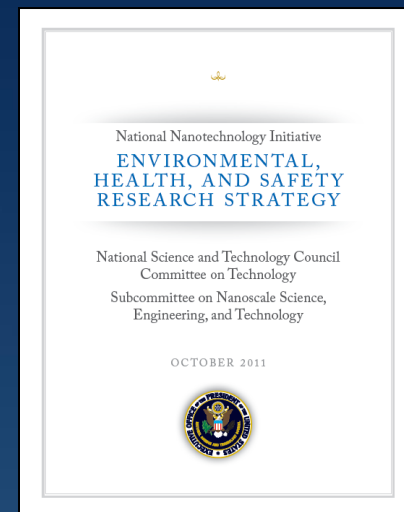
- Solar Energy
- Sustainable Nanomanufacturing
- Nanoelectronics
- Nanotechnology Knowledge Infrastructure (nanoinformatics)
- Sensors

Foundational Research  
Nanotechnology-Enabled Applications, Devices, and Systems  
Research Infrastructure and Instrumentation  
Environmental, Health, and Safety



# What does risk mean, and how do we address risks for nanotechnology?

- The 2011 NNI EHS Research Strategy was informed by a series of public workshops and included discussion of research needs pertaining to Risk Assessment and Risk Management Methods
- This workshop is being held to discuss the state of the progress (with respect to research and practice) in nanotechnology risk perception, assessment, and management
- Opportunity for a variety of stakeholders to share their perspectives and real-world experiences with respect to nanotechnology-related risks
- Aiming to synthesize information and approaches across various types of risk-based decisions and communities of decision-makers



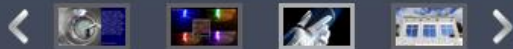
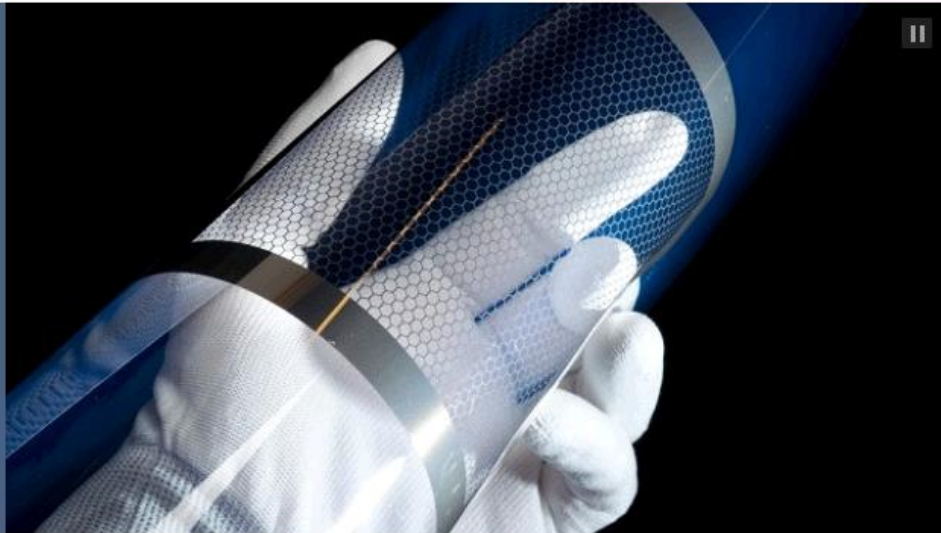
# How are we going to do this?

- Summary of how the workshop is organized:
  - Plenary talks from the perspectives of various communities, and panel discussion (Tues. a.m.)
  - Parallel breakout sessions by type of decision – with case studies and theoretical vignettes (Tues. p.m.)
  - Additional cross-community plenary talks and parallel breakout sessions by type of decision-maker (Wed. a.m.)
  - Roundtable discussions and concluding remarks (Wed. p.m.)



## Printed flexible CNTs for cheaper electronics, wall-sized displays

Researchers used a conventional, high-throughput printing process to create sheets of high-quality carbon nanotube transistors on flexible plastic (PET) sheets. These flexible sheets are made from the same kind plastic as the Coke bottle. [Read more](#)



Slideshow Archive



### FAQs for Small-Medium Business and Industry

This new page provides answers to some of the most common questions from the nanotechnology business community.

### NNI Supplement to the President's 2014 Budget

This document gives a description of

### Nanotechnology News

7/8/2013 - Nanowerk - Online

[Physicists find enhanced fluctuations in nanomagnets](#)

9/6/2013 - Nanowerk - Online

[Indiana Jones meets George Jetson](#)

9/6/2013 - ScienceDaily

[Local nanoscale electrical measurements for graphene](#)

9/6/2013 - Nanowerk - Online

Visit the NNI Budget Dashboard



The NNI Dashboard shows annual spending for the nanotechnology initiative.

*Special thanks to the organizing committee members for all their hard work!*

