

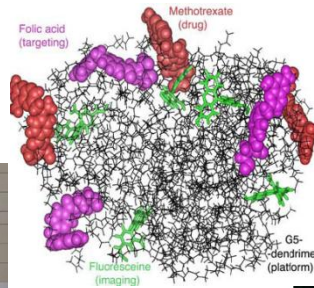
National Nanotechnology Initiative: Positioning the NNI for Its Second Decade

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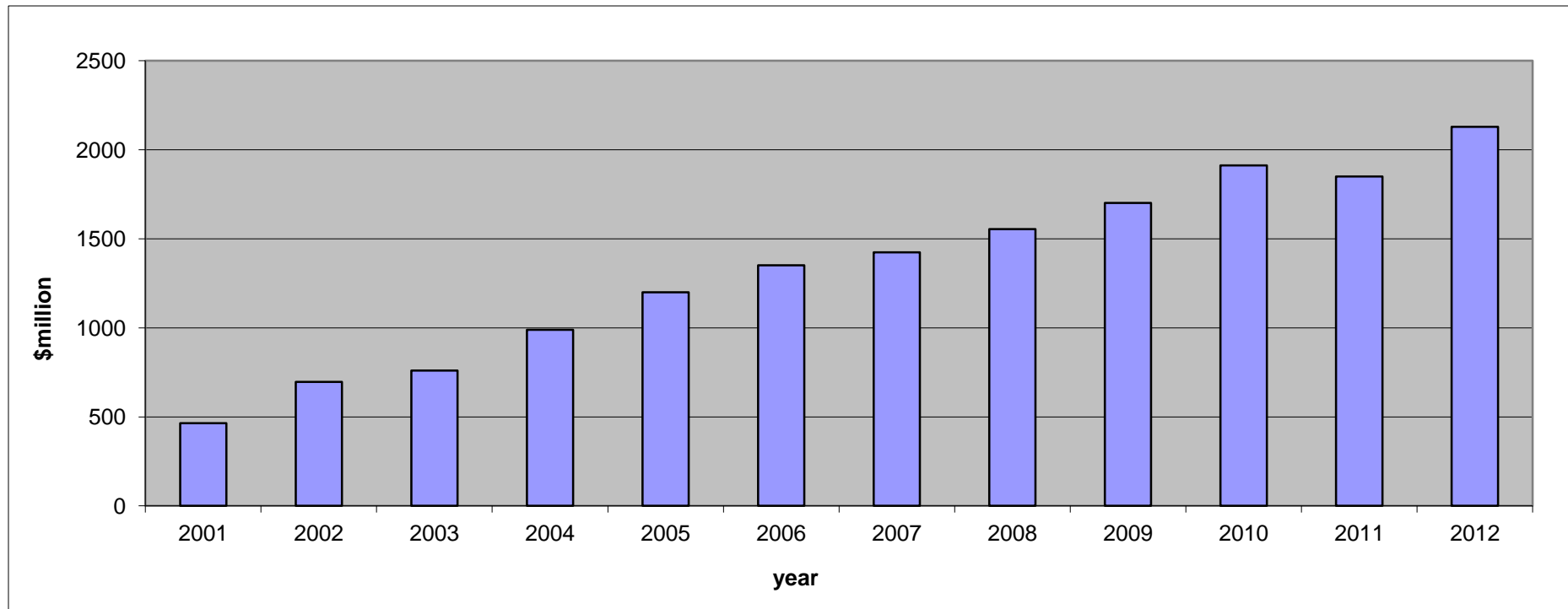
NNI Vision: What Do We See a Decade later?

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



NNI Investment

\$464 million (FY01) to over \$2.1 billion (FY12)



All numbers shown above are actual spending, except 2011, which is estimated spending under the continuing resolution, and 2012, which is requested amount for next year (FY '09 figure shown here does **not** include ~\$500 million in ARRA funding).

** 2012 request (does **not** include DOD earmarks included in previous years).

National Nanotechnology Initiative Investments v1

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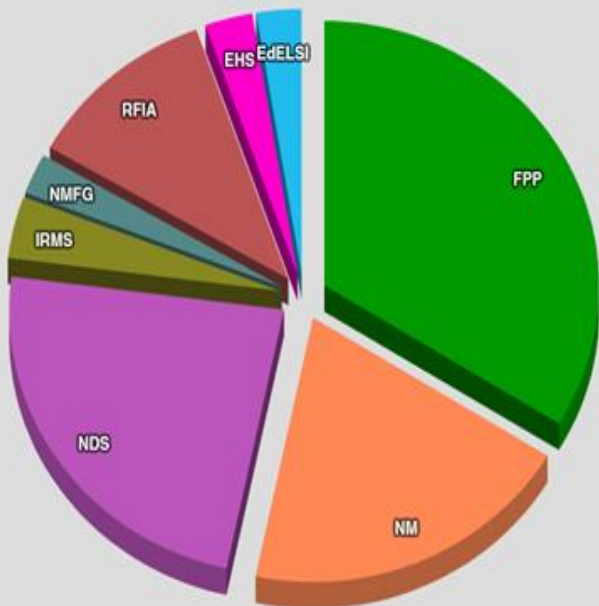
Toggle View between Agency and PCA
 Select Budget Type to power charts

NNI Agency

Actuals

National Nanotechnology Initiative (NNI) Investments

2006 > All Agencies >



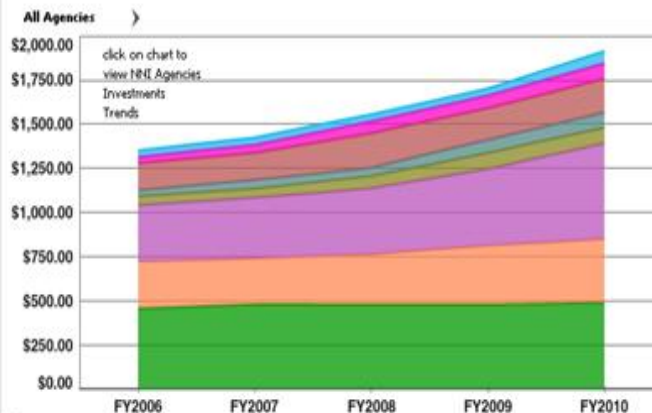
2006 > All Agencies >

Agency	Investments (\$ In Millions)
FPP	\$455.90
NM	\$265.10
NDS	\$319.60
IRMS	\$51.00
NMFG	\$33.80
RFA	\$152.40
EHS	\$37.70
EdELSI	\$35.70
Total	\$1,351.20

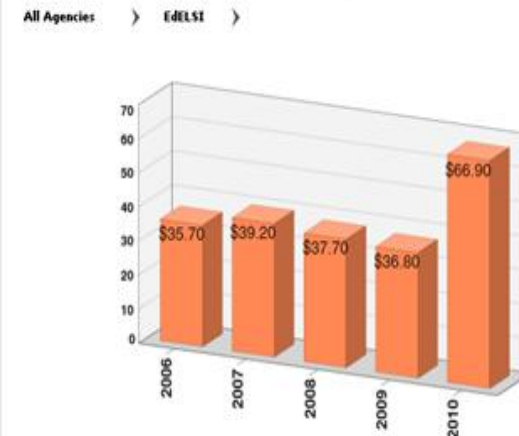
PCA Group	PCA Number	Description
FPP	1	Fundamental Phenomena & Processes
NM	2	Nanomaterials
NDS	3	Nanoscale Devices & Systems
IRMS	4	Instrument Research, Metrology & Standards
NMFG	5	Nanomanufacturing
RFA	6	Major Research Facilities & Instrument Acquisition
EHS	7	Environmental, Health & Safety
EdELSI	8	Education and Social Dimensions

NNI Agency	Description
CPSC	Consumer Product Safety Commission
DOD	Department of Defense
NSF	National Science Foundation
DOE	Department of Energy
DHHS/FDA	Department of Health and Human Services, Food and Drug Administr...
DHHS/NIH	Department of Health and Human Services, National Institutes of Health
DOC/NIST	Department of Commerce, National Institute of Standards and Technol...
NASA	National Aeronautics and Space Administration
EPA	Environmental Protection Agency
DHHS/NIOSH	Department of Health and Human Services, National Institute of Occu...
USDA/NIFA	US Department of Agriculture, National Institute of Food and Agricultur...
USDA/FS	US Department of Agriculture, Forest Service

PCA Investments Trends over the years

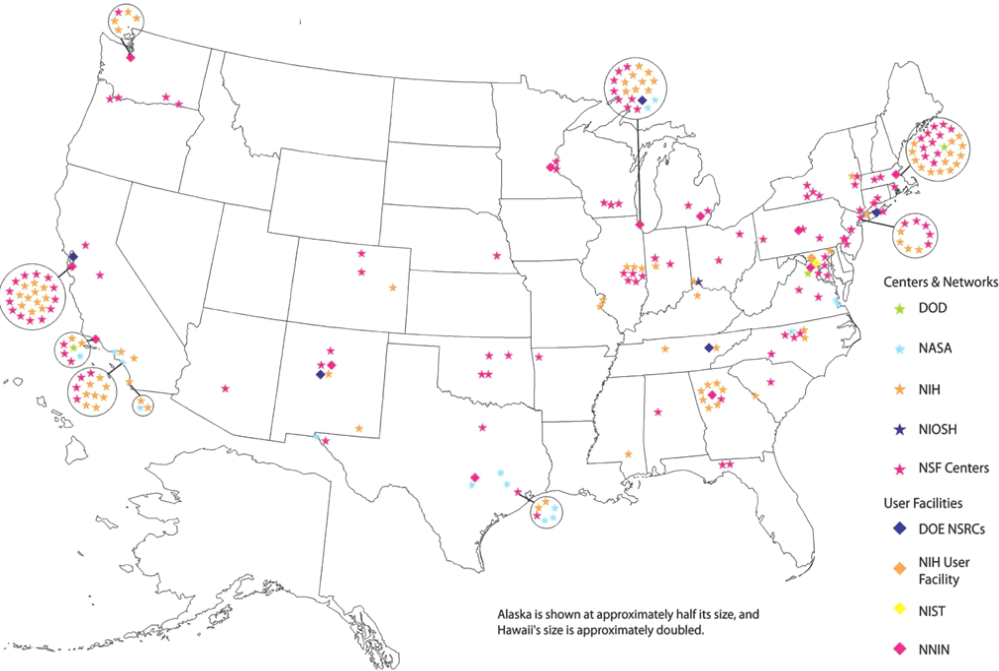


NNI Funding Trends



See the NNI Dashboard @ <http://nanodashboard.nano.gov/>

Building Infrastructure: Domestic Efforts with Global Reach



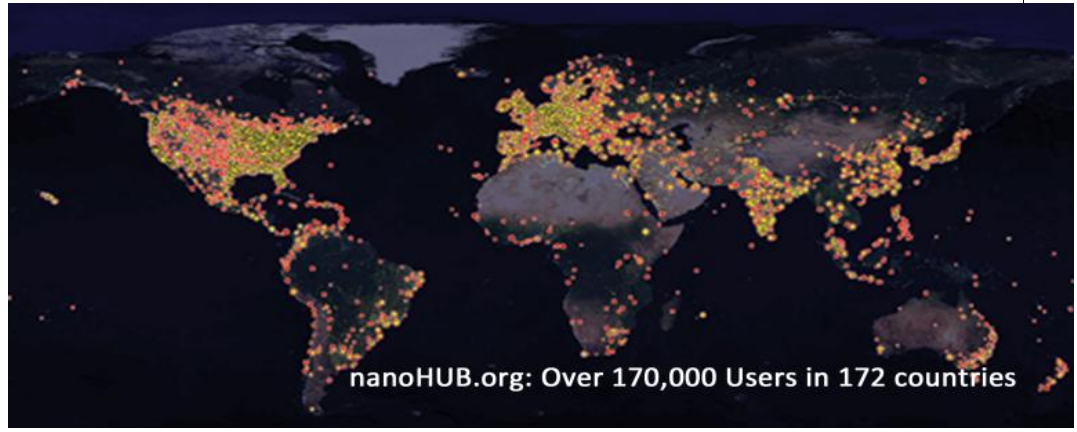
Molecular Foundry
Lawrence Berkeley National Laboratory

Center for Nanoscale Materials
Argonne National Laboratory

Center for Functional Nanomaterials
Brookhaven National Laboratory

Center for Nanophase Materials Sciences
Oak Ridge National Laboratory

Center for Integrated Nanotechnologies
Los Alamos National Laboratory & Sandia National Laboratory



NNI Support for Innovation: The First Decade

- Cumulative NNI investment of over *\$16 billion* (including the President's request for 2012).
- Advanced foundational knowledge for control of matter at the nanoscale with over *7800 research projects in all 50 states*.
- Developed an *extensive infrastructure* of interdisciplinary research centers, networks and user facilities distributed across the country.
- Invested significantly in nanotechnology-related *EHS research* to date and anticipate continuing targeted increases.
- Established major *networks for developing public awareness* of nanotechnology through informal and formal educational programs.

**What's next?
Invest where?**



2011 NNI Strategic Plan: Organizing the Innovation Pipeline

NNI Goals

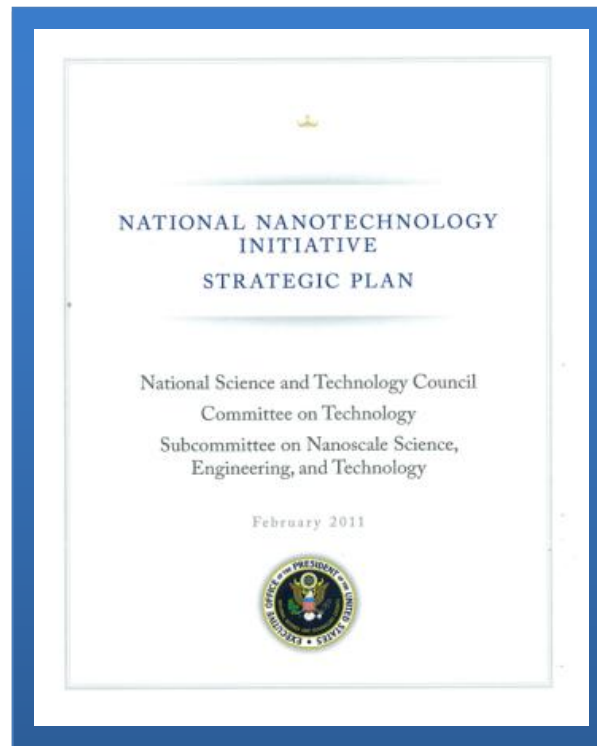
- Advance world-class nanotechnology research and development
- Foster the *transfer of new technologies* into products for commercial and public benefit
- Develop and sustain educational resources, a *skilled workforce*, and the supporting *infrastructure and tools* to advance nanotechnology
- Support responsible development of nanotechnology



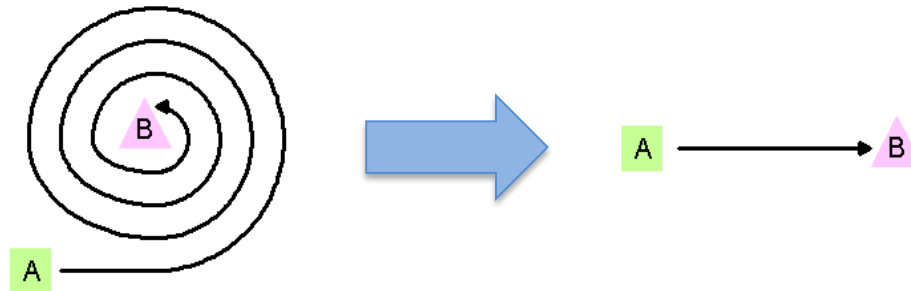
2011 NNI Strategic Plan

What's New:

- Measureable outcomes for each NNI goal
- Nanotechnology Signature Initiatives



NNI Goal 2: Foster Technology Transfer



- Develop robust, scalable nanomanufacturing methods necessary to *facilitate commercialization by doubling* the share of the NNI investment in nanomanufacturing research over the next five years.
- Increase focus on nanotechnology-based commercialization and related support for *public-private partnerships*.
- Support user facilities, research centers, and regional initiatives to *accelerate* the transfer of nanoscale science from *discovery to commercial products*.
- Help the *business community better understand* the Government's funding and regulatory environments.

New Process for Research Collaboration: NNI Signature Initiatives

- Address R&D gaps within *critical national challenges*
- *Leverage* skills, resources, and capabilities among multiple NNI agencies to maximize scientific and technological progress that may *prepare a field for industrial commercialization*
- Identify research *thrust areas* and specific agency programs
- Select *key research targets* associated with near-and long-term expected outcomes
- *Evaluate* progress on an ongoing basis

NNI Signature Initiative: Sustainable Nanomanufacturing

Agencies: NIST, NSF, DOE, DOD, EPA, IC/DNI, NIH, NIOSH/OSHA, USDA/FS

Goal: Immediate *extension of methods* to manufacture more complex components, systems, and devices that result from nanotechnology and will help *secure and strengthen the U.S. manufacturing base* by creating the industries of the future.

Thrust Areas: Use nanotechnology to improve

- design of scalable and sustainable nanomaterials, components, devices, and processes
- nanomanufacturing measurement technologies

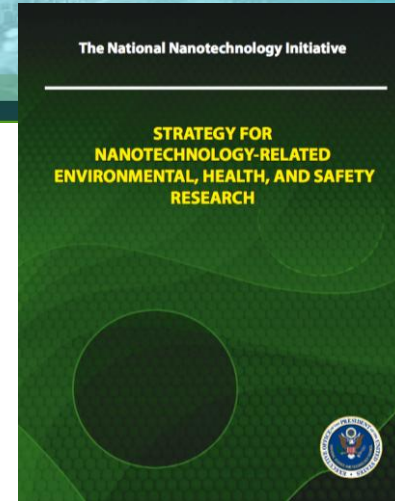
NNI Strategy Goal 4: Responsible Development

EHS Mission:

- Protect public health and the environment
- Employ science-based risk analysis and risk management
- Foster technological advancements that benefit society

*****Soon to be Released*****

***2011 NNI Environmental, Health, and Safety
Research Strategy***



Key Concepts in the 2011 EHS Research Strategy

Risk Assessment



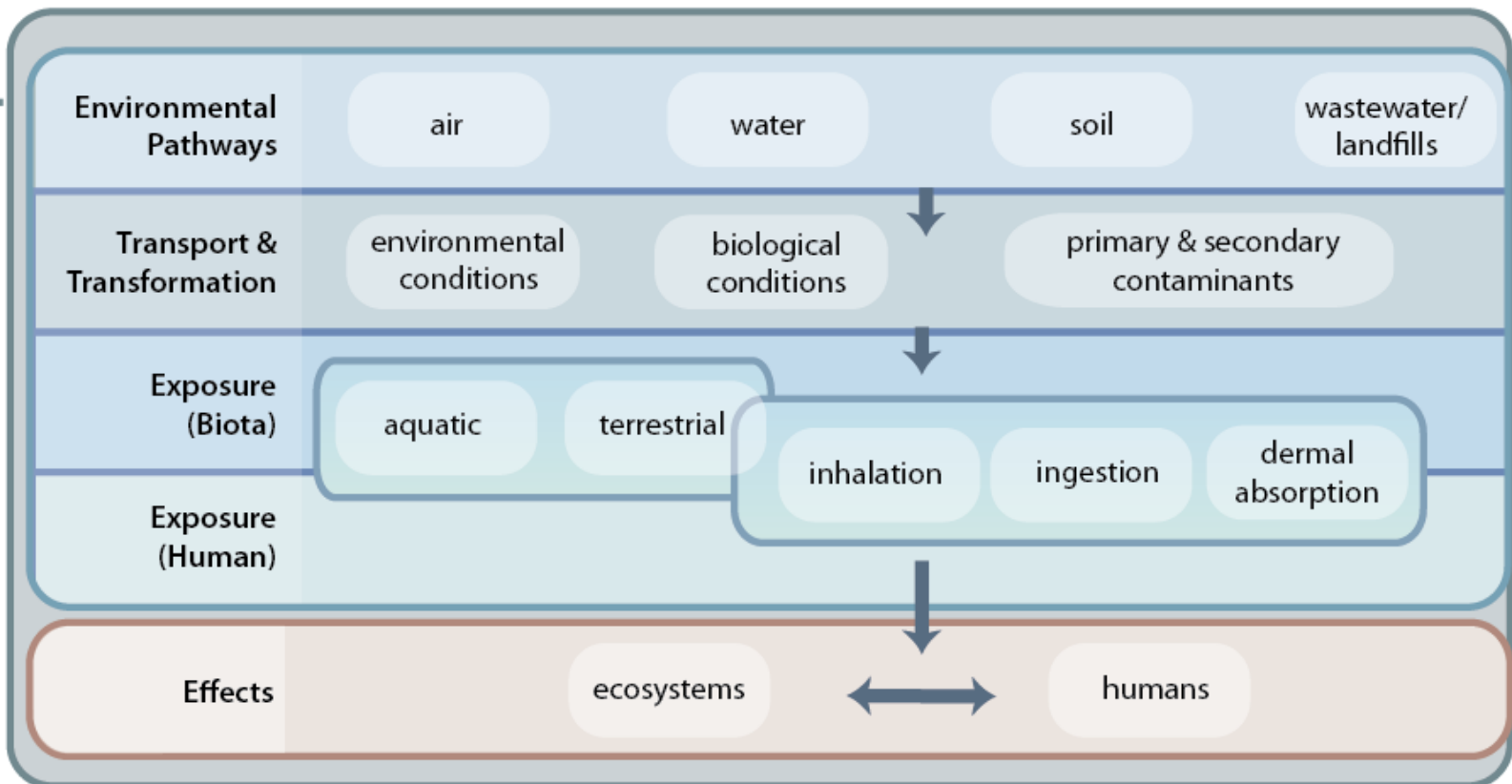
Integrating Risk Assessment Across the Product Life Cycle

Product Life Cycle Stages



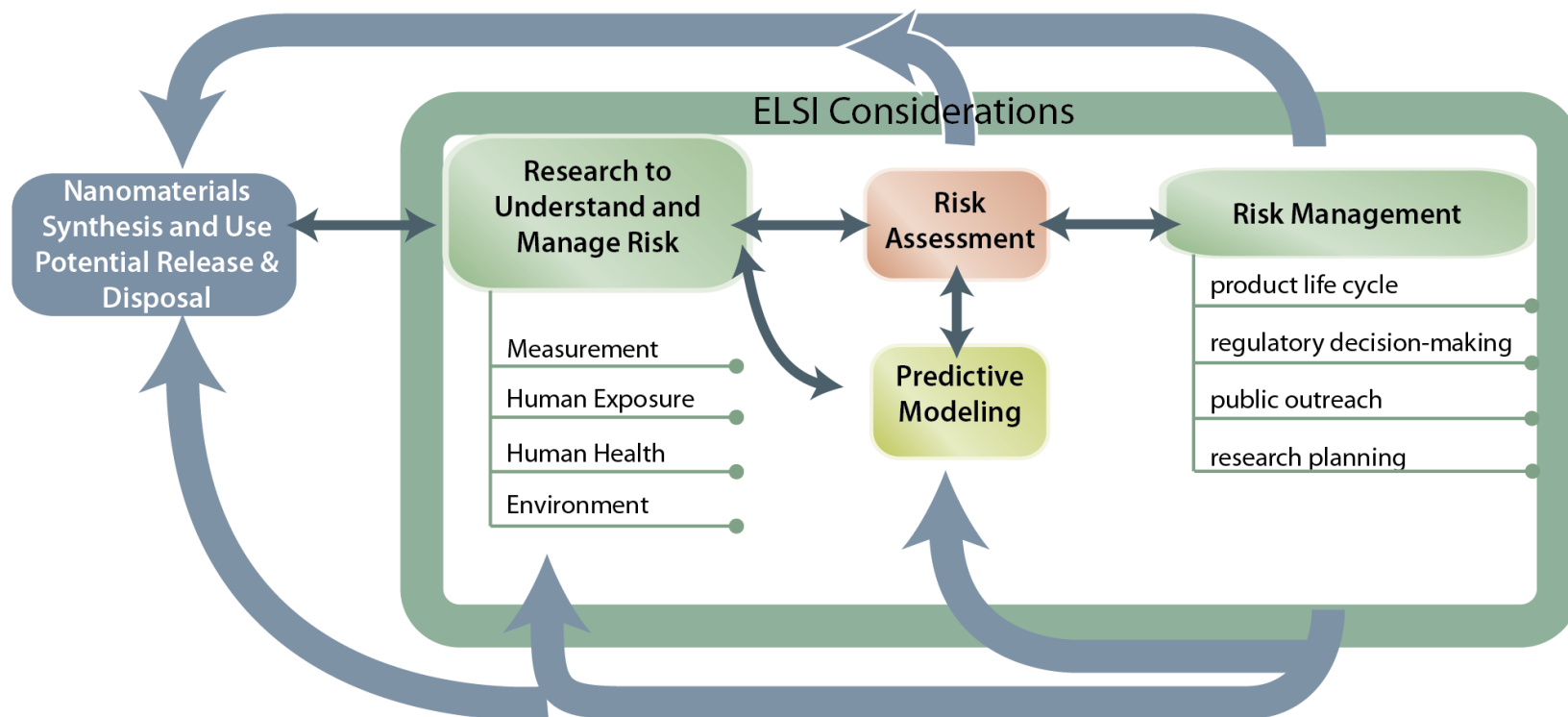
Risk Assessment Paradigm

Exposure Assessment
Transport/
Transform
Concentration
in Env.
External Dose



Hazard ID
Internal Dose
& Response

Risk Management Research Framework



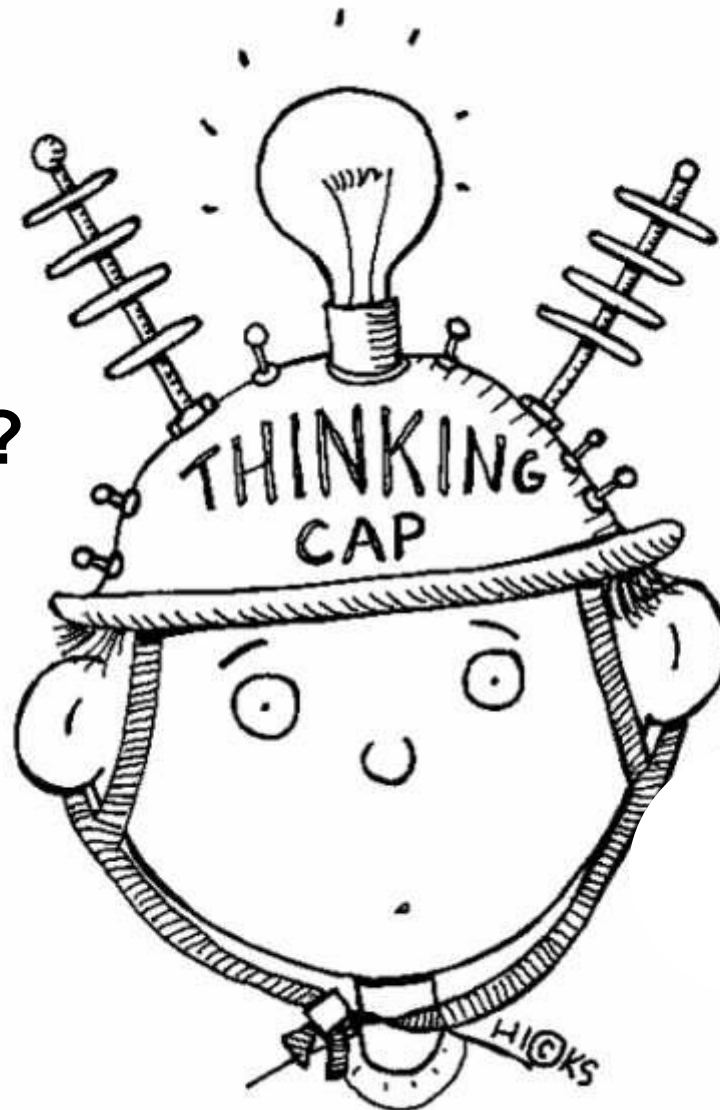
Targeting and Accelerating Research

Critical Elements:

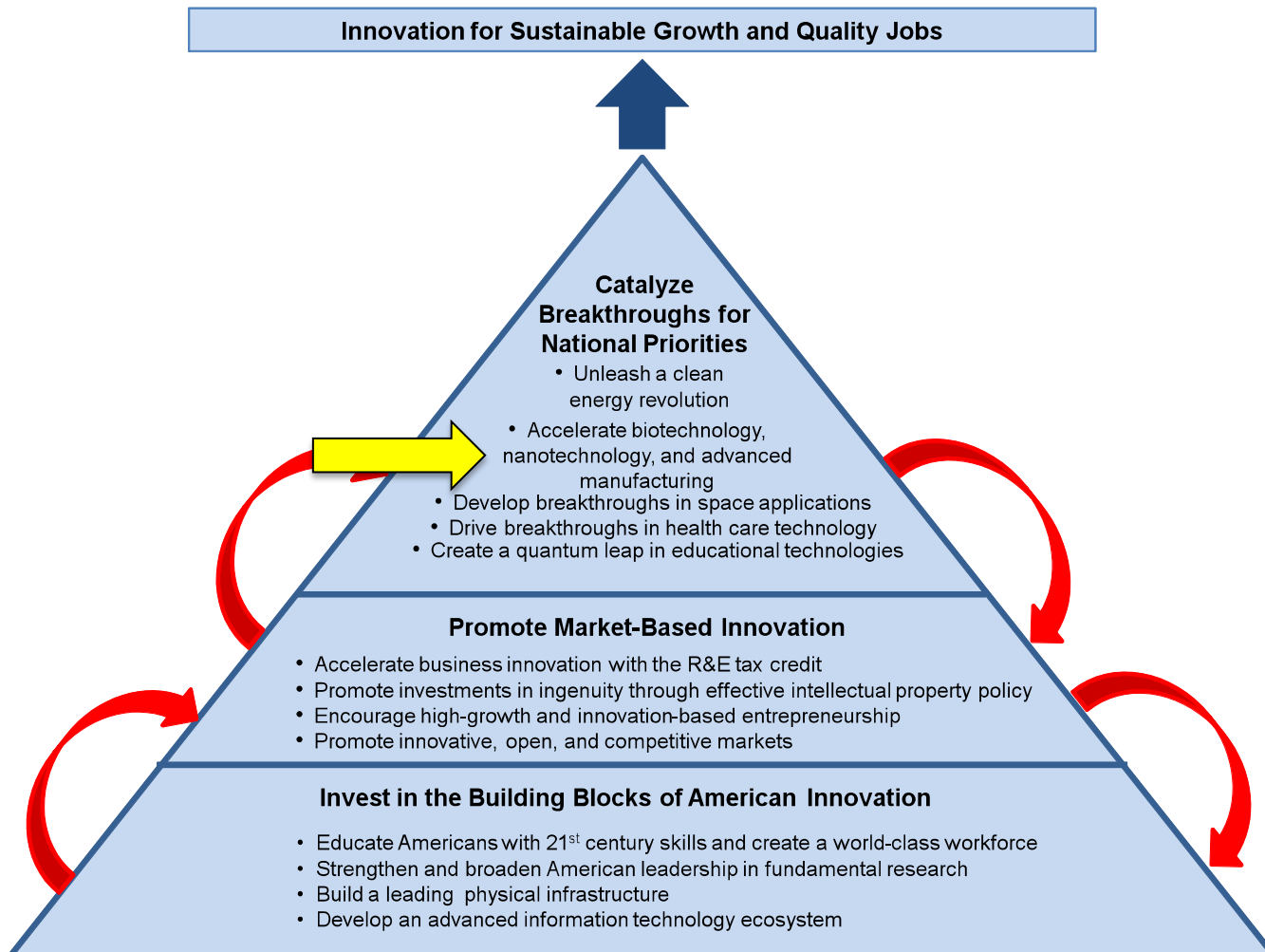
- Prioritize nanomaterials for study
- Establish standard measurements, terminology, nomenclature, assay methods
- Develop informatics and predictive modeling tools
- Stratify knowledge for risk assessment
- Partner to achieve the NNI EHS research goals, including globally



Is that ALL?



A Strategy for American Innovation

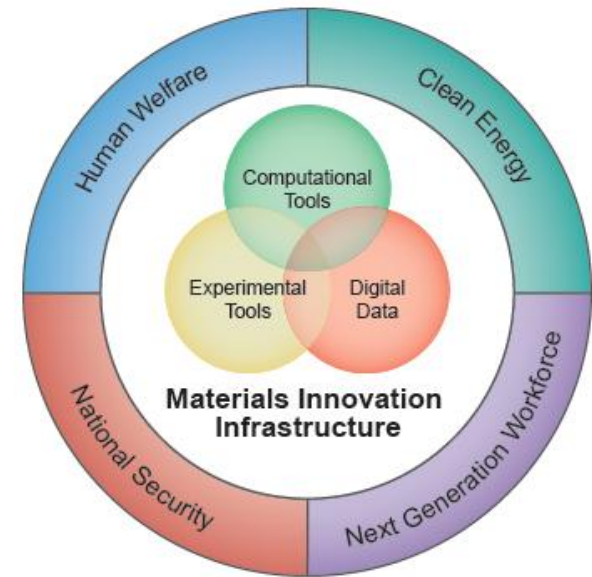
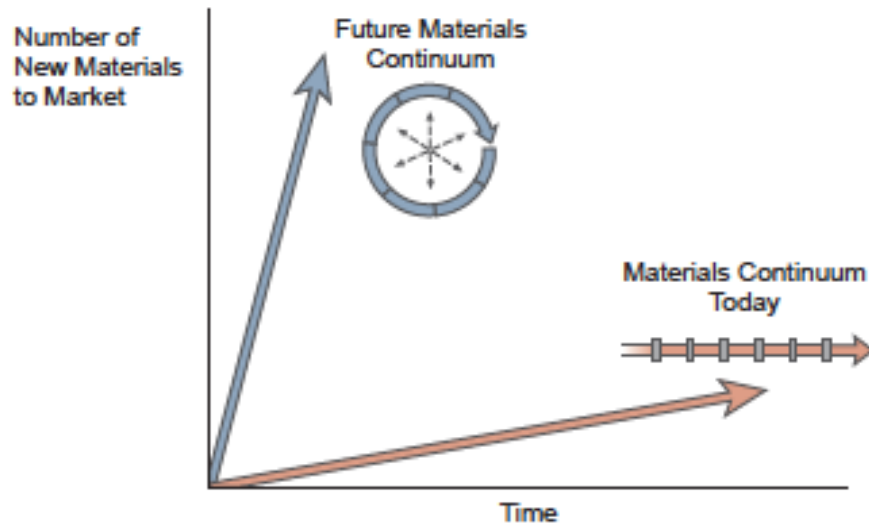


Advanced Manufacturing Partnership: Creating High-Quality Manufacturing Jobs of the Future in the US

- More than *\$500 million* initial capital
- *Industry on board*: Allegheny Technologies, Caterpillar, Corning, Dow Chemical, Ford, Honeywell, Intel, Johnson and Johnson, Northrop Grumman, Procter and Gamble, and Stryker
- *Participating universities*: MIT, Carnegie Mellon, Georgia Tech, Stanford Univ., UC Berkeley, Univ. of Michigan



Materials Genome Initiative for Global Competitiveness



Educate the New Industrial Sector



An NSF study said 6 million nanotechnology workers will be needed worldwide by 2020, with *2 million of those jobs in the US.*

- Many of these jobs can be filled by workers with *2-year degrees.*

- There are currently at least 2 dozen Associate's Degree programs in the US, with *new programs launching every semester.*

- There are more than *70 nanotechnology-specific degree programs* in higher education institutions across the U.S.

Work Together Better : NNCO Industry and State Liaison

The ISL is a *new NNCO position* with the responsibility to:

- Gather *information* from businesses and regional nanotechnology initiatives about their challenges, best practices, and activities,
- Serve as a *point of contact and informational resource* for the private sector about Federal nanotechnology resources, programs, regulatory issues, and contacts,
- Help *organize* workshops, communities of interest, and other joint activities between the Federal nanotechnology community and the private sector, and
- *Interface* with the NSET Subcommittee's Nanomanufacturing, Industry Liaison, and Innovation (NILI) Working Group to help develop inter-Agency industrial and state/regional collaborations and outreach.

Contact Jim at jkadtke@nnco.nano.gov

Communicate Better

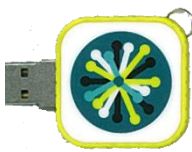


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[NanoTV](#)



NNI reports

Webinars



Facebook (*planned*)





Nanotechnology 101

Nanotechnology and You

About the NNI

Collaborations and Funding

Publications and Resources

Education

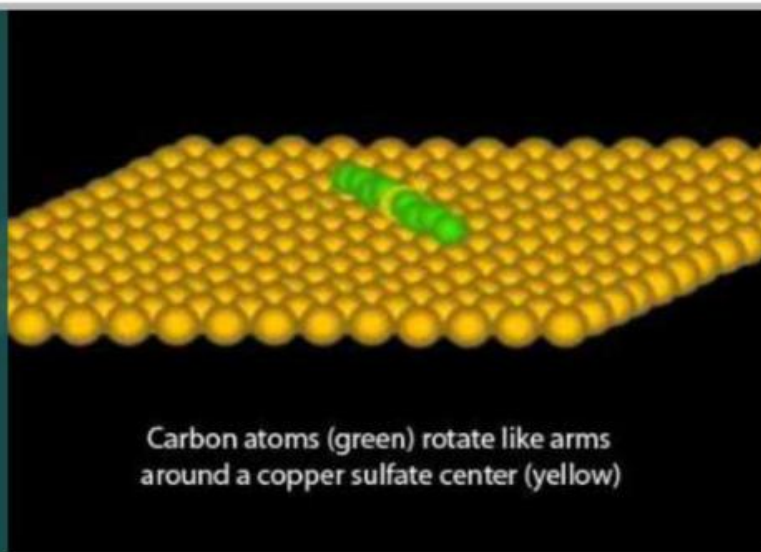
Newsroom

Events

A New World Record

Chemists at Tufts University in Boston, Mass. are submitting their work to Guinness World Records after creating the world's smallest motor, composed of a single molecule and measuring just one nanometer across.

[Learn More >>](#)



Carbon atoms (green) rotate like arms around a copper sulfate center (yellow)

1 2 3 4 5

What is Nanotech?

What are the Benefits?

How is the NNI Helping?

- Nanotechnology is the understanding and control of matter at the nanoscale, at dimensions between approximately 1 and 100 nanometers, where unique phenomena enable novel applications.
- Encompassing nanoscale science, engineering, and technology, nanotechnology involves imaging, measuring, modeling, and manipulating matter at this length scale.
- So how small is "nano"? A nanometer is one billionth of a meter. A sheet of paper is about 100,000 nanometers thick. And there are 25,400,000 nanometers in one inch.

[See more in Nano 101](#)



Nanomaterials and Human Health & Instrumentation, Metrology, and Analytical Methods

The workshop report for the third event in the nanoEHS workshop report series.

News & Media Releases



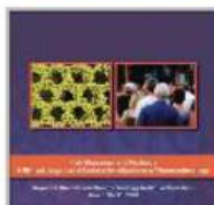
Jul 19, 2011

NNI Releases Four Workshop Reports from the nanoEHS Series

Jun 24, 2011

President Obama Launches Advanced Manufacturing Partnership

[Newsroom](#)



Risk Management Methods & Ethical, Legal, and Societal Implications of Nanotechnology

The Capstone report from the final workshop of the nanoEHS series.

Nanotechnology



Nanotechnology: Big Things from a Tiny World

Request a brochure, view it online, or print a copy yourself.

Vision of the NNI a revolution in technology and industry that benefits society.

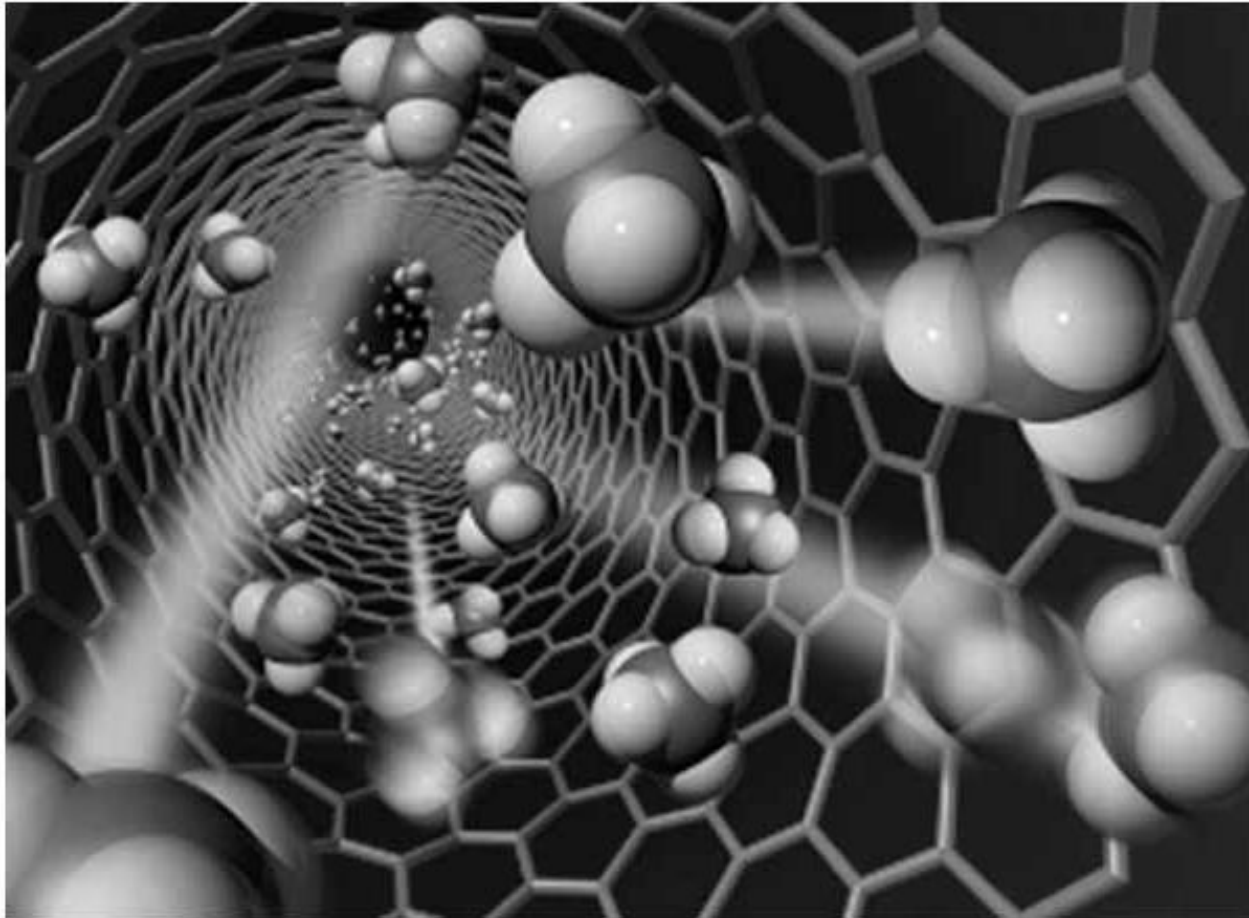
Vision for the Second Decade

A future of responsible, nanotechnology-enabled solutions.

A future in which

- agencies, industry, and stakeholders collaborate to solve critical issues for the American people and the world.
- the pipeline from material design solutions to commercialization and product stewardship that becomes more integrated, steps linked, and the timeline shorter.
- nanotechnology, nanomanufacturing, and the American worker become integral to the next generation of US industrial manufacturing practices and products.
- evaluation of risk and benefit to humans and the environment is integrated into material design and product life stages.





**Thank
You!!**

more information at nano.gov