

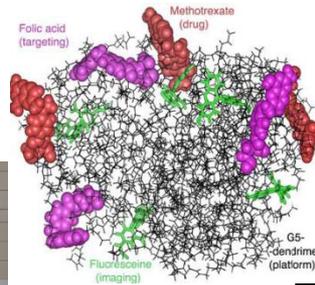
**National Nanotechnology Initiative's Signature Initiative
Sustainable Nanomanufacturing:
Creating the Industries of the Future**

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www.Nano.gov

NNI Vision

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.*



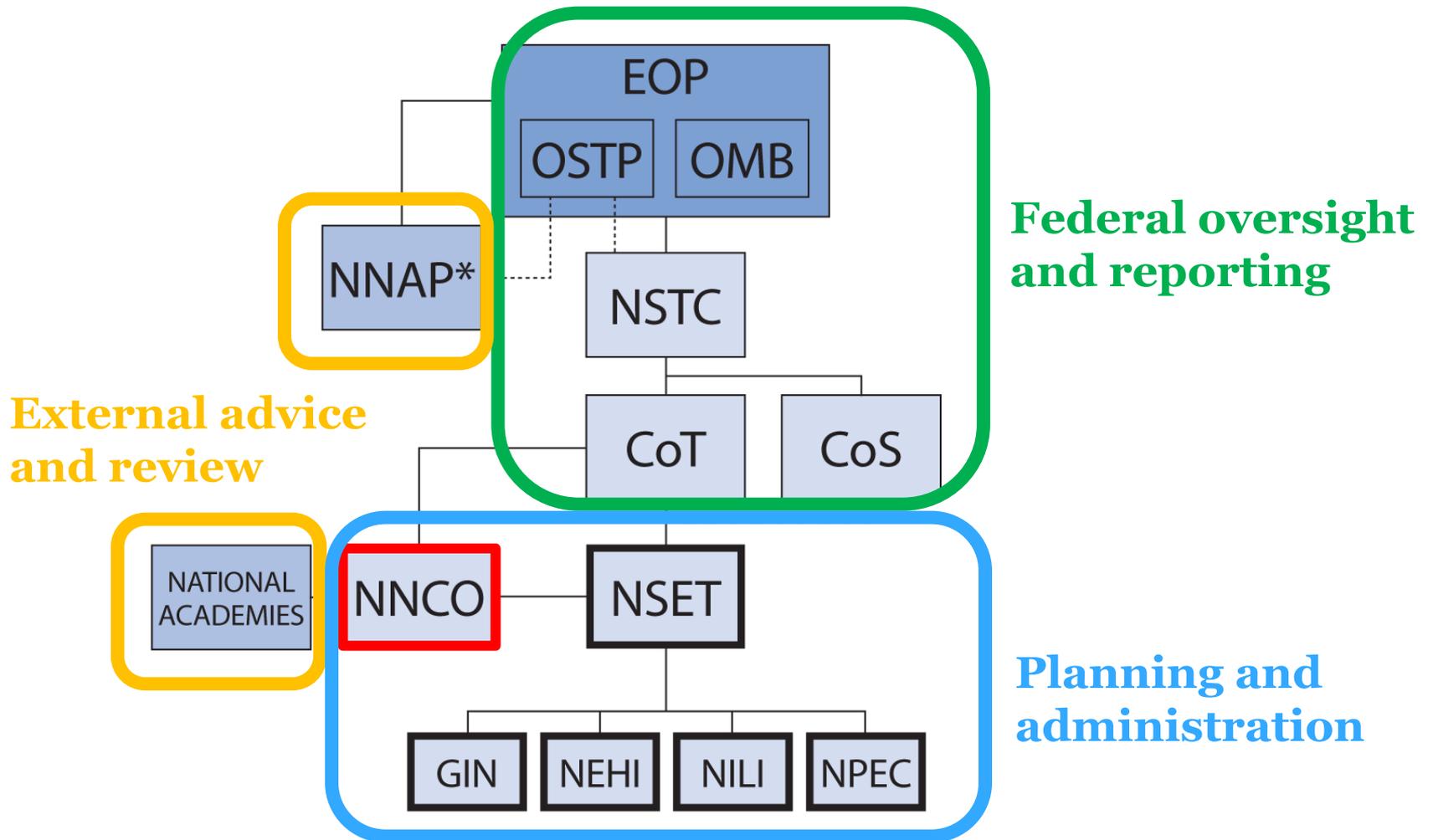
National Nanotechnology Initiative

Collaborative research and development that will advance understanding and control of matter at nanoscale for:

- National economic benefit
- National security
- Improved quality of life



Understanding the Organizational Structure



NNI Signature Initiatives

The Nanotechnology Signature Initiatives (NSIs) spotlight areas of national significance that can be more rapidly advanced through focused and closely-coordinated inter-agency collaboration.

The NSIs

- **Address R&D gaps** within areas of critical national need
 - Identify research *thrust areas*
 - Select *key research targets* associated with near-and long-term expected outcomes
- **Leverage** skills, resources, and capabilities among multiple NNI agencies to maximize scientific and technological progress
- Provide a forum for communication and *ongoing assessment* of direction and progress
- **Catalyze** communities of practice and public private partnerships to accelerate commercialization

Nanotechnology Signature Initiatives

Released July 2010

- Nanotechnology for Solar Energy Collection and Conversion
- Sustainable Nanomanufacturing: Creating the Industries of the Future
- Nanoelectronics for 2020 and Beyond

Released May 2012 with announcement of several other activities related to the Materials Genome Initiative

- Nanotechnology Knowledge Infrastructure: Enabling National Leadership in Sustainable Design (NKI)

Sustainable Nanomanufacturing: Creating the Industries of the Future

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

Goal: Establish manufacturing technologies for economical and sustainable integration of nanoscale building blocks into complex, large scale systems.

Thrust Areas:

- Design of scalable and sustainable nanomaterials, components, devices, and processes
- Nanomanufacturing measurement technologies

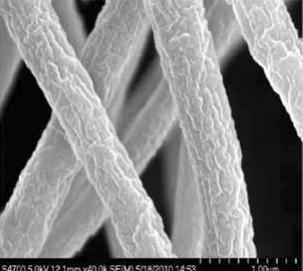
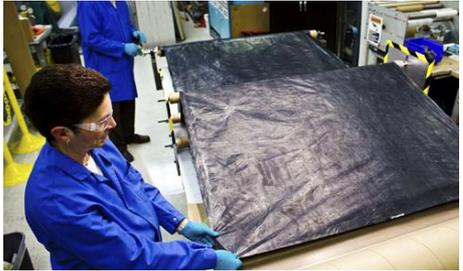
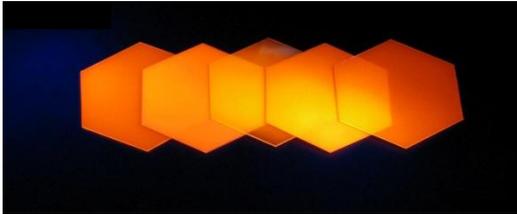
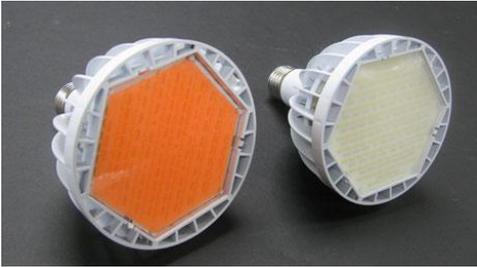
Initial focus areas will include manufactured products based on:

- Carbon-based nanomaterials
- Optical metamaterials
- Cellulosic nanomaterials

Sustainable Nanomanufacturing: Creating the Industries of the Future

Three requirements that must be addressed to enable sustainable nanomanufacturing:

- Production must be scalable to the required throughput and yield
- The generation, manipulation, and organization of nanostructures must be accomplished in a precise, controlled, and sustainable manner as demonstrated by a full life cycle analysis
- All nanotechnology-based products must perform to specification over their entire lifetimes without the release of harmful nanomaterials or other toxic substances into the environment.



Affordable Energy Efficient Lighting
Lightweight Structural Materials
Sustainable Composites
Lightweight Efficient Electric Cabling
Maintenance Free Coatings
Catalysts

