

## 2. NNI INVESTMENTS

### Budget Summary

The 2011 Budget provides nearly \$1.8 billion for the National Nanotechnology Initiative (NNI), reflecting continued steady growth in the NNI investment. This sustained major investment in nanotechnology research and development (R&D) across the Federal Government over the past eleven years of the NNI, spanning three Presidential Administrations and five Congresses, is an indication of the broad support for this program. This support is based on nanotechnology's potential to vastly improve our fundamental understanding and control of matter at the nanoscale, ultimately leading to a revolution in technology and industry for the benefit of society. While the NNI remains focused on fulfilling the Federal role of supporting basic research, infrastructure development, and technology transfer, the proposed investments for 2011 place renewed emphasis on accelerating the transition from basic R&D advances and capabilities into innovations that support national priorities such as sustainable energy technologies, healthcare, and environmental protection. This is consistent with substantial increases in the requested nanotechnology investments for 2011 at the Department of Energy, the National Institutes of Health, and the Environmental Protection Agency. The NNI is also increasing its investments aimed at implementing the Government's strategy for nanotechnology-related environmental, health, and safety (EHS) research.<sup>4</sup> As a part of this expanded EHS effort, the Food and Drug Administration and the Consumer Product Safety Commission are participating in the formal NNI budget crosscut for the first time in 2011. Increasing investments in nanotechnology R&D by other NNI participating agencies reflect the potential for this research to support diverse agency missions and responsibilities. The cumulative NNI investment since 2001, including the 2011 request, now totals over \$14 billion. This includes \$511 million in funding authorized under the American Recovery and Reinvestment Act of 2009 (P.L. 111-5). Cumulative investments in EHS research since 2005 now total over \$480 million. Cumulative investments in education and in research on ethical, legal, and other societal dimensions of nanotechnology since 2005 total over \$260 million.

The 2011 NNI budget supports nanoscale science, engineering, and technology R&D at 15 agencies. Agencies with the largest investments are:

- DOE (research providing a basis for new and improved energy technologies)
- NSF (fundamental research across all disciplines of science and engineering)
- NIH (nanotechnology-based biomedical research at the intersection of life sciences and the physical sciences)
- DOD (science and engineering research advancing defense and dual-use capabilities)
- NIST (fundamental research and development of measurement and fabrication tools, analytical methodologies, and metrology for nanotechnology)

Other agencies investing in mission-related research are EPA, NIOSH, NASA, FDA, DHS, USDA (including both NIFA and FS), CPSC, DOT (including FHWA), and DOJ.

Table 2 shows NNI investments in 2009–2011 for Federal agencies with budgets and investments for nanotechnology R&D. Tables 3–6 list the investments for 2009–2011 by agency and by program component area (PCA).

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<sup>4</sup> *Strategy for Nanotechnology-Related Environmental, Health, and Safety Research* (February 2008):

[http://www.nano.gov/NNI\\_EHS\\_Research\\_Strategy.pdf](http://www.nano.gov/NNI_EHS_Research_Strategy.pdf). NNI EHS research is defined as research whose primary purpose is to understand and address potential risks to health and the environment that engineered nanomaterials may pose.

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Table 2: NNI Budget, by Agency, 2009–2011 (dollars in millions)				
Agency	2009 Actual	2009 Recovery*	2010 Estimated	2011 Proposed
DOE**	332.6	293.2	372.9	423.9
NSF	408.6	101.2	417.7	401.3
HHS/NIH	342.8	73.4	360.6	382.4
DOD***	459.0	0.0	436.4	348.5
DOC/NIST	93.4	43.4	114.4	108.0
EPA	11.6	0.0	17.7	20.0
HHS/NIOSH	6.7	0.0	9.5	16.5
NASA	13.7	0.0	13.7	15.8
HHS/FDA	6.5	0.0	7.3	15.0
DHS	9.1	0.0	11.7	11.7
USDA/NIFA	9.9	0.0	10.4	8.9
USDA/FS	5.4	0.0	5.4	5.4
CPSC	0.2	0.0	0.2	2.2
DOT/FHWA	0.9	0.0	3.2	2.0
DOJ	1.2	0.0	0.0	0.0
<b>TOTAL****</b>	<b>1,701.5</b>	<b>511.3</b>	<b>1,781.1</b>	<b>1,761.6</b>

\* Based on allocations of the American Recovery and Reinvestment Act of 2009 (P.L. 111-5) appropriations. Agencies may report additional ARRA funding for SBIR and STTR projects later, when 2009 SBIR/STTR data become available.

\*\* Funding levels for DOE include the Office of Science, the Office of Energy Efficiency and Renewable Energy, the Office of Fossil Energy, the Office of Nuclear Energy, and the Advanced Research Projects Agency–Energy.

\*\*\* In Tables 2–4, the 2009 and 2010 DOD figures include Congressionally directed funding that is outside the NNI plan (\$117 million for 2009).

\*\*\*\* For Tables 2–7, totals may not add, due to rounding.

### Key points about the 2010 and 2011 NNI investments

- Beyond the \$1.7 billion in total NNI investments reported under the respective 2009 agency appropriations, an additional \$511 million was provided for nanotechnology research and infrastructure investments in 2009 through the American Recovery and Reinvestment Act (ARRA) of 2009. This substantial ARRA enhancement to the NNI in 2009 included investments across all of the NNI PCAs, with particular emphasis on PCA 2 (nanomaterials, where DOE alone increased its investment by \$138 million) and on PCA 6 (major research facilities & instrumentation acquisition), where NIST, DOE, and NSF allocated over \$72 million to upgrade equipment and facilities at NNI user facilities and research centers.
- Research on fundamental nanoscale phenomena and processes (PCA 1) remains the largest program component area, with \$484 million requested for 2011. Combined with PCA 2 (nanomaterials, \$342 million in the 2011 request), this basic research component of the NNI portfolio represents just under half of the total NNI funding request, reflecting the continued importance of sustained Federal funding for fundamental research, feeding the innovation pipeline.
- The Department of Energy now has the largest nanotechnology investment among the NNI agencies, requesting a total of \$424 million for 2011. The increase in 2011 over 2010 is due in part to new investments at the Advanced Research Projects Agency–Energy (ARPA–E), as well as increased funding at the Office of Science and the Office of Energy Efficiency and Renewable Energy.