U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON TECHNOLOGY AND INNOVATION

HEARING CHARTER

An Overview of the National Institute of Standards and
Technology Budget for Fiscal Year 2013

Tuesday, March 6, 2012
11:00 a.m. - 1:00 p.m.
2318 Rayburn House Office Building

1. Purpose

On Tuesday, March 6, 2012, the Technology and Innovation Subcommittee of the House Committee on Science, Space, and Technology will hold a hearing to examine the Administration's proposed fiscal year 2013 (FY13) budget request for the National Institute of Standards and Technology (NIST). An Administration witness will review the proposed budget in the context of the President's overall priorities for NIST.

2. Witness

Dr. Patrick Gallagher, Under Secretary of Commerce for Standards and Technology and Director, National Institute of Standards and Technology

3. Hearing Overview

The National Institute of Standards and Technology (NIST) is a non-regulatory agency within the Department of Commerce. Originally founded in 1901 as the National Bureau of Standards, NIST's mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. By working closely alongside industry, NIST has become recognized as a provider of high-quality information utilized by the private sector.

NIST operates two main research laboratories in Gaithersburg, Maryland, and Boulder, Colorado, as well as radio stations in Hawaii and Colorado. NIST also maintains partnerships with the Hollings Marine Labs in Charleston, South Carolina, the JILA joint institute operated with the University of Colorado, and the Center for Advanced Research in Biotechnology (CARB) and the Joint Quantum Institute, both operated in conjunction with the University of Maryland.

NIST employs about 2,900 scientists, engineers, technicians, support, and administrative personnel. In addition, NIST annually hosts about 2,600 associates and facility users from academia, industry, and other government agencies. NIST also partners with 1,300 manufacturing specialists and staff at about 350 Manufacturing Extension Partnership (MEP) service locations around the country.[1]

National Institute for Standards and Technology (NIST) Spending

(dollars in millions)

Account	FY11 Actual	FY12 Enacted	FY13 Request	FY13 Request versus FY12 Enacted	
				$	%
Scientific & Technical Research and Services (STRS)	**507.0**	**567.0**	**648.0**	**81.0**	**14.3**
Construction of Research Facilities (CRF)	**69.9**	**55.4**	**60.0**	**4.6**	**8.3**
Industrial Technology Services (ITS)	**173.3**	**128.4**	**149.0**	**20.6**	**16.0**
Technology Innovation Program (TIP) ł	*69.9*	*0*	*0*	*0*	*0*
Manufacturing Extension Partnership (MEP)	*124.7*	*128.4*	*128*	*(0.4)*	*-0.3*
Advanced Manufacturing Technology Consortia (AMTech) ∗	*--*	*--*	*21.0*	*21.0*	*100.0*
Baldrige Performance Excellence Program∗∗	*9.6*	*0*	*0*	*0*	*0*
Totals:	**750.2**	**750.8**	**857.0**	**106.2**	**14.1**

∗ new initiative
∗∗in FY11 funded under STRS account
ł terminated in FY12

NIST Budget Summary

The FY13 budget request for NIST is $857 million, an increase of $106.2 million or 14.1 percent from the FY12 enacted level. The budget for NIST is divided into three main accounts: Scientific and Technical Research and Services (STRS), Construction of Research Facilities (CRF), and Industrial Technology Services (ITS). The FY13 budget request also includes plans for two mandatory appropriations: The Wireless Innovation Fund (WIN), which will be provided up to $300 million from broadband spectrum auction proceeds; and the National Network for Manufacturing Innovation (NNMI), a legislative proposal for $1 billion in mandatory funding to promote the development of manufacturing technologies with broad applications.

NIST FY13 Budget Priorities

The budget request would provide $648 million for NIST's Core Laboratory research programs in the Scientific and Technical Research and Services (STRS), an increase of $81.0 million. The

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[1] http://www.nist.gov/public_affairs/general_information.cfm (Updated February 3, 2012).

STRS request focuses on the following initiatives: supporting Advanced Manufacturing activities ($45 million); creating a competitive grant program for Universities to establish NIST Centers of Excellence ($20 million); addressing challenges within Forensic Science ($5 million), Advanced Communications ($10 million), and Disaster Resilience ($5 million); and continued support for National Strategy for Trusted Identities in Cyberspace (NSTIC) ($8 million).

The budget request provides $149 million for NIST's Industrial Technology Services (ITS) programs, including $128 million for the Manufacturing Extension Partnership (MEP) program, and $21 million for the creation of an Advanced Manufacturing Technology (AMTech) Consortia Program.

The breadth of technology in the U.S economy results in a broad technical portfolio for NIST. The NIST programs must maintain technical leadership in measurement science, while also responding effectively to the rapid pace of technological innovation. NIST uses a comprehensive annual planning process to develop program priorities that support NIST's mission to promote economic prosperity and job creation in a technology-based economy.[2] (See Appendix A for NIST Strategic Goals and Programmatic Planning Priorities.)

Scientific and Technical Research and Services (STRS)

The FY13 NIST budget request for Scientific and Technical Research and Services (STRS) is $648 million, an increase of $81 million or 14.3 percent over the FY12 level, and contains an increase of $45 million in measurement science research for advanced manufacturing. The budget request also includes $20 million to establish four competitively selected Centers for Excellence in measurement science areas defined by NIST. Under this program, grants would be awarded to multi or single university centers for five to seven years to provide an interdisciplinary environment where NIST, academic, and industry researchers can collaborate on basic and applied research focused on innovations in measurement science and new technology development.

In order to advance measurement science, standards, and technology, NIST currently operates six laboratory units:

- **Material Measurement Laboratory (MML):** The MML serves as the national reference laboratory for measurements in the chemical, biological, and material sciences. The MML provides measurement services used by a broad set of industries including but not limited to: healthcare (biomarkers), renewable energy (measuring the quality of fuels) and forensic science (biometric identification techniques).
- **Physical Measurement Laboratory (PLM):** The PLM develops and disseminates the national standards of measurement, e.g., length, mass, force and shock, acceleration, time and frequency, electricity, temperature, humidity and pressure. This information supports consistent timekeeping, on which many technologies like GPS rely, and underpins the safety of our national electricity grid.

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[2] *National Institute of Standards and Technology Fiscal Year 2013 Budget Submission to Congress*, Overview p. 9.

- **Engineering Laboratory (EL):** The EL develops and disseminates advanced manufacturing and construction technologies, guidelines, and services to the U.S. manufacturing and construction industries. Examples of EL work include researching ways to reduce the spread of fire in residential buildings and developing performance metrics for advanced manufacturing processes.
- **Information Technology Laboratory (ITL):** The ITL develops and disseminates standards, measurements, and testing for interoperability, security, usability, and reliability of information systems, including cyber security standards and guidelines for federal agencies and U.S. industry. ITL works in areas such as cloud computing, health information technology, and advanced voting technologies.
- **Center for Nanoscale Science and Technology (CNST):** The CNST is the only national nanotechnology center focused on commerce. The facility offers shared space – utilized by a variety of public and private stakeholders – for nanoscale fabrication and measurement, and develops innovative nanoscale measurement and fabrication capabilities.
- **Center for Neutron Research (NCNR):** The NCNR provides a national user facility, utilized by universities, government and industry, to study neutron-based measurement capabilities. The level of measurement capabilities is unavailable anywhere else in the country, allowing researchers to answer questions in nanoscience and technology with a broad range of applications.

NIST Centers of Excellence
In FY13, NIST has requested $20 million to provide grants to establish four competitively selected Centers of Excellence (COE) in measurement sciences in areas defined by NIST, to leverage and expand NIST research capabilities. Each COE would provide an environment in which NIST, academia, and industry collaborate in pursuing early stage basic and applied research focused on innovations in measurement science and emerging technology areas.

Construction of Research Facilities (CRF)
The FY13 budget request for Construction of Research Facilities (CRF) is $60 million, an 8.3 percent increase over the FY12 enacted level. CRF funding would support maintenance and repair of existing NIST buildings ($48.2 million) as well as continue the interior renovation efforts of Building 1 on the NIST-Boulder campus ($11.8 million).

Industrial Technology Services (ITS)
In addition to the NIST laboratories, NIST manages several extramural programs supporting industry. The FY13 budget request for Industrial Technology Services (ITS) is $149 million, an increase of $20.6 million or 16 percent over the FY12 level.

The $128 million request for the Manufacturing Extension Partnership (MEP) program is a $0.4 million or 0.3 percent decrease from the FY12 level. The MEP program is a public/private partnership run by Centers in all 50 states and Puerto Rico that provides technical assistance for small and medium-sized manufacturers to modernize their operations and adapt to foreign competition. MEP Centers are supported by equal contributions from federal funds, state funds, and industry client fees.

The FY13 budget request includes $21.0 million for the proposed Advanced Manufacturing Technology Consortia (AMTech) Program. This program was also included in the FY12 budget request, but it did not receive funding. Modeled after the Nanoelectronics Research Initiative (NRI), a partnership between NSF, NIST, industry, and universities across the nation, the AMTech program would establish industry-led consortia to identify and prioritize research projects supporting long-term industrial research needs. The program would provide cost-shared funding to consortia that are focused on developing advanced technologies to address major technical problems that inhibit development and widespread adoption of advanced manufacturing capabilities in the United States.

National Network for Manufacturing Innovation (NNMI)
The FY13 budget request includes a proposal for $1 billion in mandatory funding to revitalize U.S. manufacturing through the establishment of a National Network for Manufacturing Innovation (NNMI). The NMMI would represent collaboration between NIST, the Department of Defense, the Department of Energy, and the National Science Foundation to promote the development of manufacturing technologies with broad applications and to support manufacturing technology commercialization by bridging the gap between the laboratory and the market.

Wireless Innovation (WIN) Fund
As part of the $7 billion National Wireless Initiative included in the American Jobs Act, the Administration has included a plan to invest broadband spectrum auction proceeds in a variety of areas, including providing NIST with up to $300 million for a Wireless Innovation (WIN) Fund to develop innovative wireless technologies. NIST would work with industry and public safety organizations to increase the interoperability of public safety communications within the future nationwide broadband network.

APPENDIX A: NIST Strategic Goals and Programmatic Planning[3]

NIST Strategic Goals

NIST's mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. With this aim of promoting U.S. innovation and industrial competitiveness, NIST has established three overarching strategic goals to guide and align investments in its programs:

1. **Position NIST to accelerate technology development, promote advanced manufacturing, and promote industrial competitiveness.**
   - Accelerate and strengthen engagement in documentary standards.
   - Improve the development and delivery of measurement services.
   - Enhance user access and collaboration at our unique facilities.

2. **Strengthen our core technical and organizational capabilities.**
   - Invest in the basic research required to meet the NIST mission.
   - Improve facilities and equipment to ensure NIST maintains a leading measurement capability.
   - Develop world-class operations and support activities, especially in safety management.

3. **Promote innovation, commercialization, and business growth.**
   - Support the acceleration and promotion of innovation through AMTech and other programs.
   - Support business success through MEP.

NIST Programmatic Planning Priorities

Based on NIST's three strategic goals, and input from customers, stakeholders, Congress, and the Administration, NIST plans to continue to invest resources into six priority areas:

Manufacturing: Improve the competitiveness of U.S. manufacturers through the development and deployment of new, green technologies and better business practices. Efforts include focus on enhancing high technology manufacturing innovation in products and processes, especially nanomanufacturing, resulting in new jobs.

Information Technology and Cybersecurity: Help to develop more capable, secure, and interoperable information systems to ensure U.S. leadership in information technology. Provide technical support for successful deployment of next generation broadband. Supply measurement capabilities necessary for next-generation information technologies.

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[3] *National Institute of Standards and Technology Fiscal Year 2013 Budget Submission to Congress*, Overview p. 9-10.

Energy: Speed development of alternative, clean-energy energy sources, from production through storage to final distribution. Help to ensure interoperability of Smart Grid devices and systems (as assigned in the 2007 Energy Independence and Security Act).

Healthcare: Advance efforts aimed at achieving lower-cost, higher-quality health care, including development of technologies that ensure more accurate diagnoses, reduce medical errors, and improve the efficiency and effectiveness of therapies. Develop standards essential to interoperable health-care information systems that seamlessly and accurately share information among all health-care providers; and ensure security and privacy of information.

Environment and Consumer Safety: Promote efficient development of sustainable products and processes, from manufacturing to end-use by consumers. Help to establish the scientific measurement basis for accurate climate and greenhouse gas emissions measurements.

Physical Infrastructure: Develop the needed measurement solutions, models, calibration inspection methods, and technologies that can be used to predict the remaining life or margins of safety for infrastructure systems to prioritize and optimize infrastructure spending.