

with respect to nanotechnology research and development, including the identification of any critical research areas where the United States should be the world leader to best achieve the goals of the Program; and

(13) an analysis of the current impact of nanotechnology on the United States economy and recommendations for increasing its future impact.

**(b) Study on molecular self-assembly**

As part of the first quadrennial review conducted in accordance with subsection (a), the National Research Council shall conduct a one-time study to determine the technical feasibility of molecular self-assembly for the manufacture of materials and devices at the molecular scale.

**(c) Study on the responsible development of nanotechnology**

As part of the first quadrennial review conducted in accordance with subsection (a), the National Research Council shall conduct a one-time study to assess the need for standards, guidelines, or strategies for ensuring the responsible development of nanotechnology, including, but not limited to—

- (1) self-replicating nanoscale machines or devices;
- (2) the release of such machines in natural environments;
- (3) encryption;
- (4) the development of defensive technologies;
- (5) the use of nanotechnology in the enhancement of human intelligence; and
- (6) the use of nanotechnology in developing artificial intelligence.

**(d) Report**

**(1) In general**

Not later than 30 days after the date the first evaluation under subsection (a) is received, and quadrennially thereafter, the Director of the National Nanotechnology Coordination Office shall report to the President its assessments under subsection (c) and its recommendations for ways to improve the Program.

**(2) Congress**

Not later than 30 days after the date the President receives the report under paragraph (1), the Director of the Office of Science and Technology Policy shall transmit a copy of the report to Congress.

(Pub. L. 108–153, § 5, Dec. 3, 2003, 117 Stat. 1928; Pub. L. 114–329, title II, § 204(b)(3), Jan. 6, 2017, 130 Stat. 2999.)

AMENDMENTS

2017—Pub. L. 114–329, § 204(b)(3)(A)–(D), substituted “Quadrennial” for “Triennial” in section catchline and “quadrennial” for “triennial” in subsecs. (a) to (c).

Subsec. (d). Pub. L. 114–329, § 204(b)(3)(E), amended subsec. (d) generally. Prior to amendment, text read as follows: “The Director of the National Nanotechnology Coordination Office shall transmit the results of any evaluation for which it made arrangements under subsection (a) to the Advisory Panel, the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science upon

receipt. The first such evaluation shall be transmitted no later than June 10, 2005, with subsequent evaluations transmitted to the Committees every 3 years thereafter.”

**§ 7505. Authorization of appropriations**

**(a) National Science Foundation**

There are authorized to be appropriated to the Director of the National Science Foundation to carry out the Director’s responsibilities under this chapter—

- (1) \$385,000,000 for fiscal year 2005;
- (2) \$424,000,000 for fiscal year 2006;
- (3) \$449,000,000 for fiscal year 2007; and
- (4) \$476,000,000 for fiscal year 2008.

**(b) Department of Energy**

There are authorized to be appropriated to the Secretary of Energy to carry out the Secretary’s responsibilities under this chapter—

- (1) \$317,000,000 for fiscal year 2005;
- (2) \$347,000,000 for fiscal year 2006;
- (3) \$380,000,000 for fiscal year 2007; and
- (4) \$415,000,000 for fiscal year 2008.

**(c) National Aeronautics and Space Administration**

There are authorized to be appropriated to the Administrator of the National Aeronautics and Space Administration to carry out the Administrator’s responsibilities under this chapter—

- (1) \$34,100,000 for fiscal year 2005;
- (2) \$37,500,000 for fiscal year 2006;
- (3) \$40,000,000 for fiscal year 2007; and
- (4) \$42,300,000 for fiscal year 2008.

**(d) National Institute of Standards and Technology**

There are authorized to be appropriated to the Director of the National Institute of Standards and Technology to carry out the Director’s responsibilities under this chapter—

- (1) \$68,200,000 for fiscal year 2005;
- (2) \$75,000,000 for fiscal year 2006;
- (3) \$80,000,000 for fiscal year 2007; and
- (4) \$84,000,000 for fiscal year 2008.

**(e) Environmental Protection Agency**

There are authorized to be appropriated to the Administrator of the Environmental Protection Agency to carry out the Administrator’s responsibilities under this chapter—

- (1) \$5,500,000 for fiscal year 2005;
- (2) \$6,050,000 for fiscal year 2006;
- (3) \$6,413,000 for fiscal year 2007; and
- (4) \$6,800,000 for fiscal year 2008.

(Pub. L. 108–153, § 6, Dec. 3, 2003, 117 Stat. 1929.)

**§ 7506. Department of Commerce programs**

**(a) NIST programs**

The Director of the National Institute of Standards and Technology shall—

- (1) as part of the Program activities under section 7501(b)(7) of this title, establish a program to conduct basic research on issues related to the development and manufacture of nanotechnology, including metrology; reliability and quality assurance; processes control; and manufacturing best practices; and
- (2) utilize the Manufacturing Extension Partnership program<sup>1</sup> to the extent possible to

<sup>1</sup> See Change of Name note below.

ensure that the research conducted under paragraph (1) reaches small- and medium-sized manufacturing companies.

**(b) Clearinghouse**

The Secretary of Commerce or his designee, in consultation with the National Nanotechnology Coordination Office and, to the extent possible, utilizing resources at the National Technical Information Service, shall establish a clearinghouse of information related to commercialization of nanotechnology research, including information relating to activities by regional, State, and local commercial nanotechnology initiatives; transition of research, technologies, and concepts from Federal nanotechnology research and development programs into commercial and military products; best practices by government, universities and private sector laboratories transitioning technology to commercial use; examples of ways to overcome barriers and challenges to technology deployment; and use of manufacturing infrastructure and workforce.

(Pub. L. 108-153, §7, Dec. 3, 2003, 117 Stat. 1930.)

CHANGE OF NAME

The Manufacturing Extension Partnership Program, referred to in subsec. (a), redesignated the Hollings Manufacturing Partnership Program by a provision of title II of div. B of Pub. L. 108-447, formerly set out as a note under section 278k of this title. Program subsequently designated the Hollings Manufacturing Extension Partnership by former section 278k(i) of this title, as added by Pub. L. 111-358, and by section 278k of this title, as generally amended by Pub. L. 114-329.

**§ 7507. Department of Energy programs**

**(a) Research consortia**

**(1) Department of Energy program**

The Secretary of Energy shall establish a program to support, on a merit-reviewed and competitive basis, consortia to conduct interdisciplinary nanotechnology research and development designed to integrate newly developed nanotechnology and microfluidic tools with systems biology and molecular imaging.

**(2) Authorization of appropriations**

Of the sums authorized for the Department of Energy under section 7505(b) of this title, \$25,000,000 shall be used for each fiscal year 2005 through 2008 to carry out this section. Of these amounts, not less than \$10,000,000 shall be provided to at least 1 consortium for each fiscal year.

**(b) Research centers and major instrumentation**

The Secretary of Energy shall carry out projects to develop, plan, construct, acquire, operate, or support special equipment, instrumentation, or facilities for investigators conducting research and development in nanotechnology.

(Pub. L. 108-153, §8, Dec. 3, 2003, 117 Stat. 1930.)

**§ 7508. Additional centers**

**(a) American Nanotechnology Preparedness Center**

The Program shall provide for the establishment, on a merit-reviewed and competitive

basis, of an American Nanotechnology Preparedness Center which shall—

(1) conduct, coordinate, collect, and disseminate studies on the societal, ethical, environmental, educational, legal, and workforce implications of nanotechnology; and

(2) identify anticipated issues related to the responsible research, development, and application of nanotechnology, as well as provide recommendations for preventing or addressing such issues.

**(b) Center for nanomaterials manufacturing**

The Program shall provide for the establishment, on a merit reviewed and competitive basis, of a center to—

(1) encourage, conduct, coordinate, commission, collect, and disseminate research on new manufacturing technologies for materials, devices, and systems with new combinations of characteristics, such as, but not limited to, strength, toughness, density, conductivity, flame resistance, and membrane separation characteristics; and

(2) develop mechanisms to transfer such manufacturing technologies to United States industries.

**(c) Reports**

The Council, through the Director of the National Nanotechnology Coordination Office, shall submit to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science—

(1) within 6 months after December 3, 2003, a report identifying which agency shall be the lead agency and which other agencies, if any, will be responsible for establishing the Centers described in this section; and

(2) within 18 months after December 3, 2003, a report describing how the Centers described in this section have been established.

(Pub. L. 108-153, §9, Dec. 3, 2003, 117 Stat. 1930.)

CHANGE OF NAME

Committee on Science of House of Representatives changed to Committee on Science and Technology of House of Representatives by House Resolution No. 6, One Hundred Tenth Congress, Jan. 5, 2007. Committee on Science and Technology of House of Representatives changed to Committee on Science, Space, and Technology of House of Representatives by House Resolution No. 5, One Hundred Twelfth Congress, Jan. 5, 2011.

**§ 7509. Definitions**

In this chapter:

**(1) Advisory Panel**

The term “Advisory Panel” means the President’s National Nanotechnology Advisory Panel established or designated under section 7503 of this title.

**(2) Nanotechnology**

The term “nanotechnology” means the science and technology that will enable one to understand, measure, manipulate, and manufacture at the atomic, molecular, and supramolecular levels, aimed at creating materials, devices, and systems with fundamentally new molecular organization, properties, and functions.