

110TH CONGRESS
2D SESSION

H. R. 5940

To authorize activities for support of nanotechnology research and development, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MAY 1, 2008

Mr. GORDON of Tennessee (for himself, Mr. HALL of Texas, Mr. BAIRD, Mr. EHLERS, Ms. EDDIE BERNICE JOHNSON of Texas, Mr. SENSENBRENNER, Mr. UDALL of Colorado, Mr. SMITH of Texas, Mr. WU, Mr. BARTLETT of Maryland, Mr. MILLER of North Carolina, Mr. LUCAS, Mr. LIPINSKI, Mrs. BIGGERT, Ms. GIFFORDS, Mr. AKIN, Ms. HOOLEY, Mr. NEUGEBAUER, Mr. ROTHMAN, Mr. INGLIS of South Carolina, Mr. WILSON of Ohio, Mr. McCAUL of Texas, Mr. MARIO DIAZ-BALART of Florida, Mr. GINGREY, and Mr. BILBRAY) introduced the following bill; which was referred to the Committee on Science and Technology

A BILL

To authorize activities for support of nanotechnology research and development, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “National
5 Nanotechnology Initiative Amendments Act of 2008”.

1 **SEC. 2. NATIONAL NANOTECHNOLOGY PROGRAM AMEND-**
2 **MENTS.**

3 The 21st Century Nanotechnology Research and De-
4 velopment Act (15 U.S.C. 7501 et seq.) is amended—

5 (1) by striking section 2(c)(4) and inserting the
6 following new paragraph:

7 “(4) develop, within 12 months after the date
8 of enactment of the National Nanotechnology Initia-
9 tive Amendments Act of 2008, and update every 3
10 years thereafter, a strategic plan to guide the activi-
11 ties described under subsection (b) that specifies
12 near-term and long-term objectives for the Program,
13 the anticipated time frame for achieving the near-
14 term objectives, and the metrics to be used for as-
15 sessing progress toward the objectives, and that de-
16 scribes—

17 “(A) how the Program will move results
18 out of the laboratory and into applications for
19 the benefit of society, including through co-
20 operation and collaborations with nanotechnol-
21 ogy research, development, and technology tran-
22 sition initiatives supported by the States;

23 “(B) how the Program will encourage and
24 support interdisciplinary research and develop-
25 ment in nanotechnology; and

1 “(C) proposed research in areas of national
2 importance in accordance with the requirements
3 of section 5 of the National Nanotechnology
4 Initiative Amendments Act of 2008;”;

5 (2) in section 2—

6 (A) in subsection (d)—

7 (i) by redesignating paragraphs (1)
8 through (5) as paragraphs (2) through (6),
9 respectively; and

10 (ii) by inserting the following new
11 paragraph before paragraph (2), as so re-
12 designated by clause (i) of this subpara-
13 graph:

14 “(1) the Program budget, for the previous fiscal
15 year, for each agency that participates in the Pro-
16 gram, including a breakout of spending for the de-
17 velopment and acquisition of research facilities and
18 instrumentation, for each program component area,
19 and for all activities pursuant to subsection
20 (b)(10);”;

21 (B) by inserting at the end the following
22 new subsection:

23 “(e) STANDARDS SETTING.—The agencies partici-
24 pating in the Program shall support the activities of com-
25 mittees involved in the development of standards for

1 nanotechnology and may reimburse the travel costs of sci-
2 entists and engineers who participate in activities of such
3 committees.”;

4 (3) by striking section 3(b) and inserting the
5 following new subsection:

6 “(b) FUNDING.—(1) The operation of the National
7 Nanotechnology Coordination Office shall be supported by
8 funds from each agency participating in the Program. The
9 portion of such Office’s total budget provided by each
10 agency for each fiscal year shall be in the same proportion
11 as the agency’s share of the total budget for the Program
12 for the previous fiscal year, as specified in the report re-
13 quired under section 2(d)(1).

14 “(2) The annual report under section 2(d) shall in-
15 clude—

16 “(A) a description of the funding required by
17 the National Nanotechnology Coordination Office to
18 perform the functions specified under subsection (a)
19 for the next fiscal year by category of activity, in-
20 cluding the funding required to carry out the re-
21 quirements of section 2(b)(10)(D), subsection (d) of
22 this section, and section 5;

23 “(B) a description of the funding required by
24 such Office to perform the functions specified under
25 subsection (a) for the current fiscal year by category

1 of activity, including the funding required to carry
2 out the requirements of subsection (d); and

3 “(C) the amount of funding provided for such
4 Office for the current fiscal year by each agency par-
5 ticipating in the Program.”;

6 (4) by inserting at the end of section 3 the fol-
7 lowing new subsection:

8 “(d) PUBLIC INFORMATION.—(1) The National
9 Nanotechnology Coordination Office shall develop and
10 maintain a database accessible by the public of projects
11 funded under the Environmental, Health, and Safety, the
12 Education and Societal Dimensions, and the
13 Nanomanufacturing program component areas, or any
14 successor program component areas, including a descrip-
15 tion of each project, its source of funding by agency, and
16 its funding history. For the Environmental, Health, and
17 Safety program component area, or any successor pro-
18 gram component area, projects shall be grouped by major
19 objective as defined by the research plan required under
20 section 3(b) of the National Nanotechnology Initiative
21 Amendments Act of 2008. For the Education and Societal
22 Dimensions program component area, or any successor
23 program component area, the projects shall be grouped in
24 subcategories of—

25 “(A) education in formal settings;

1 “(B) education in informal settings;

2 “(C) public outreach; and

3 “(D) ethical, legal, and other societal issues.

4 “(2) The National Nanotechnology Coordination Of-
5 fice shall develop, maintain, and publicize information on
6 nanotechnology facilities supported under the Program,
7 and may include information on nanotechnology facilities
8 supported by the States, that are accessible for use by in-
9 dividuals from academic institutions and from industry.
10 The information shall include at a minimum the terms and
11 conditions for the use of each facility, a description of the
12 capabilities of the instruments and equipment available for
13 use at the facility, and a description of the technical sup-
14 port available to assist users of the facility.”;

15 (5) in section 4(a)—

16 (A) by striking “or designate”;

17 (B) by inserting “as a distinct entity”
18 after “Advisory Panel”; and

19 (C) by inserting at the end “The Advisory
20 Panel shall form a subpanel with membership
21 having specific qualifications tailored to enable
22 it to carry out the requirements of subsection
23 (e)(7).”;

24 (6) in section 4(b), by striking “or designated”
25 and “or designating”;

1 (7) by amending section 5 to read as follows:

2 **“SEC. 5. TRIENNIAL EXTERNAL REVIEW OF THE NATIONAL**
3 **NANOTECHNOLOGY PROGRAM.**

4 “(a) IN GENERAL.—The Director of the National
5 Nanotechnology Coordination Office shall enter into an ar-
6 rangement with the National Research Council of the Na-
7 tional Academy of Sciences to conduct a triennial review
8 of the Program. The Director shall ensure that the ar-
9 rangement with the National Research Council is con-
10 cluded in order to allow sufficient time for the reporting
11 requirements of subsection (b) to be satisfied. Each tri-
12 ennial review shall include an evaluation of the—

13 “(1) research priorities and technical content of
14 the Program, including whether the allocation of
15 funding among program component areas, as des-
16 igned according to section 2(c)(2), is appropriate;

17 “(2) effectiveness of the Program’s manage-
18 ment and coordination across agencies and dis-
19 ciplines, including an assessment of the effectiveness
20 of the National Nanotechnology Coordination Office;

21 “(3) Program’s scientific and technological ac-
22 complishments and its success in transferring tech-
23 nology to the private sector; and

24 “(4) adequacy of the Program’s activities ad-
25 dressing ethical, legal, environmental, and other ap-

1 appropriate societal concerns, including human health
2 concerns.

3 “(b) EVALUATION TO BE TRANSMITTED TO CON-
4 GRESS.—The National Research Council shall document
5 the results of each triennial review carried out in accord-
6 ance with subsection (a) in a report that includes any rec-
7 ommendations for ways to improve the Program’s man-
8 agement and coordination processes and for changes to
9 the Program’s objectives, funding priorities, and technical
10 content. Each report shall be submitted to the Director
11 of the National Nanotechnology Coordination Office, who
12 shall transmit it to the Advisory Panel, the Committee on
13 Commerce, Science, and Transportation of the Senate,
14 and the Committee on Science and Technology of the
15 House of Representatives not later than September 30 of
16 every third year, with the first report due September 30,
17 2009.

18 “(c) FUNDING.—Of the amounts provided in accord-
19 ance with section 3(b)(1), the following amounts shall be
20 available to carry out this section:

21 “(1) \$500,000 for fiscal year 2009.

22 “(2) \$500,000 for fiscal year 2010.

23 “(3) \$500,000 for fiscal year 2011.”; and

24 (8) in section 10—

1 (A) by amending paragraph (2) to read as
2 follows:

3 “(2) NANOTECHNOLOGY.—The term
4 ‘nanotechnology’ means the science and technology
5 that will enable one to understand, measure, manip-
6 ulate, and manufacture at the nanoscale, aimed at
7 creating materials, devices, and systems with fun-
8 damentally new properties or functions.”; and

9 (B) by adding at the end the following new
10 paragraph:

11 “(7) NANOSCALE.—The term ‘nanoscale’ means
12 one or more dimensions of between approximately 1
13 and 100 nanometers.”.

14 **SEC. 3. SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.**

15 (a) COORDINATOR FOR SOCIETAL DIMENSIONS OF
16 NANOTECHNOLOGY.—The Director of the Office of
17 Science and Technology Policy shall designate an associate
18 director of the Office of Science and Technology Policy
19 as the Coordinator for Societal Dimensions of
20 Nanotechnology. The Coordinator shall be responsible for
21 oversight of the coordination, planning, and budget
22 prioritization of activities required by section 2(b)(10) of
23 the 21st Century Nanotechnology Research and Develop-
24 ment Act (15 U.S.C. 7501(b)(10)). The Coordinator shall,
25 with the assistance of appropriate senior officials of the

1 agencies funding activities within the Environmental,
2 Health, and Safety and the Education and Societal Di-
3 mensions program component areas of the Program, or
4 any successor program component areas, ensure that the
5 requirements of such section 2(b)(10) are satisfied. The
6 responsibilities of the Coordinator shall include—

7 (1) ensuring that a research plan for the envi-
8 ronmental, health, and safety research activities re-
9 quired under subsection (b) is developed, updated,
10 and implemented and that the plan is responsive to
11 the recommendations of the subpanel of the Advi-
12 sory Panel established under section 4(a) of the 21st
13 Century Nanotechnology Research and Development
14 Act (15 U.S.C. 7503(a)), as amended by this Act;

15 (2) encouraging and monitoring the efforts of
16 the agencies participating in the Program to allocate
17 the level of resources and management attention
18 necessary to ensure that the ethical, legal, environ-
19 mental, and other appropriate societal concerns re-
20 lated to nanotechnology, including human health
21 concerns, are addressed under the Program, includ-
22 ing the implementation of the research plan de-
23 scribed in subsection (b); and

24 (3) encouraging the agencies required to de-
25 velop the research plan under subsection (b) to iden-

1 tify, assess, and implement suitable mechanisms for
2 the establishment of public-private partnerships for
3 support of environmental, health, and safety re-
4 search.

5 (b) RESEARCH PLAN.—

6 (1) IN GENERAL.—The Coordinator for Societal
7 Dimensions of Nanotechnology shall convene and
8 chair a panel comprised of representatives from the
9 agencies funding research activities under the Envi-
10 ronmental, Health, and Safety program component
11 area of the Program, or any successor program com-
12 ponent area, and from such other agencies as the
13 Coordinator considers necessary to develop, periodi-
14 cally update, and coordinate the implementation of
15 a research plan for this program component area. In
16 developing and updating the plan, the panel con-
17 vened by the Coordinator shall solicit and be respon-
18 sive to recommendations and advice from—

19 (A) the subpanel of the Advisory Panel es-
20 tablished under section 4(a) of the 21st Cen-
21 tury Nanotechnology Research and Develop-
22 ment Act (15 U.S.C. 7503(a)), as amended by
23 this Act; and

24 (B) the agencies responsible for environ-
25 mental, health, and safety regulations associ-

1 ated with the production, use, and disposal of
2 nanoscale materials and products.

3 (2) DEVELOPMENT OF STANDARDS.—The plan
4 required under paragraph (1) shall include a de-
5 scription of how the Program will help to ensure the
6 development of—

7 (A) standards related to nomenclature as-
8 sociated with engineered nanoscale materials;

9 (B) engineered nanoscale standard ref-
10 erence materials for environmental, health, and
11 safety testing; and

12 (C) standards related to methods and pro-
13 cedures for detecting, measuring, monitoring,
14 sampling, and testing engineered nanoscale ma-
15 terials for environmental, health, and safety im-
16 pacts.

17 (3) COMPONENTS OF PLAN.—The plan required
18 under paragraph (1) shall, with respect to activities
19 described in paragraphs (1) and (2)—

20 (A) specify near-term research objectives
21 and long-term research objectives;

22 (B) specify milestones associated with each
23 near-term objective and the estimated time and
24 resources required to reach each milestone;

1 (C) with respect to subparagraphs (A) and
2 (B), describe the role of each agency carrying
3 out or sponsoring research in order to meet the
4 objectives specified under subparagraph (A) and
5 to achieve the milestones specified under sub-
6 paragraph (B);

7 (D) specify the funding allocated to each
8 major objective of the plan and the source of
9 funding by agency for the current fiscal year;
10 and

11 (E) estimate the funding required for each
12 major objective of the plan and the source of
13 funding by agency for the following 3 fiscal
14 years.

15 (4) TRANSMITTAL TO CONGRESS.—The plan re-
16 quired under paragraph (1) shall be submitted not
17 later than 60 days after the date of enactment of
18 this Act to the Committee on Commerce, Science,
19 and Transportation of the Senate and the Com-
20 mittee on Science and Technology of the House of
21 Representatives.

22 (5) UPDATING AND APPENDING TO REPORT.—
23 The plan required under paragraph (1) shall be up-
24 dated annually and appended to the report required
25 under section 2(d) of the 21st Century Nanotechnol-

1 ogy Research and Development Act (15 U.S.C.
2 7501(d)).

3 (c) NANOTECHNOLOGY PARTNERSHIPS.—

4 (1) ESTABLISHMENT.—As part of the program
5 authorized by section 9 of the National Science
6 Foundation Authorization Act of 2002, the Director
7 of the National Science Foundation shall provide 1
8 or more grants to establish partnerships as defined
9 by subsection (a)(2) of that section, except that each
10 such partnership shall include 1 or more businesses
11 engaged in the production of nanoscale materials,
12 products, or devices. Partnerships established in ac-
13 cordance with this subsection shall be designated as
14 “Nanotechnology Education Partnerships”.

15 (2) PURPOSE.—Nanotechnology Education
16 Partnerships shall be designed to recruit and help
17 prepare secondary school students to pursue postsec-
18 ondary level courses of instruction in nanotechnol-
19 ogy. At a minimum, grants shall be used to sup-
20 port—

21 (A) professional development activities to
22 enable secondary school teachers to use cur-
23 ricular materials incorporating nanotechnology
24 and to inform teachers about career possibilities
25 for students in nanotechnology;

1 (B) enrichment programs for students, in-
2 cluding access to nanotechnology facilities and
3 equipment at partner institutions, to increase
4 their understanding of nanoscale science and
5 technology and to inform them about career
6 possibilities in nanotechnology as scientists, en-
7 gineers, and technicians; and

8 (C) identification of appropriate nanotech-
9 nology educational materials and incorporation
10 of nanotechnology into the curriculum for sec-
11 ondary school students at one or more organiza-
12 tions participating in a Partnership.

13 (3) SELECTION.—Grants under this subsection
14 shall be awarded in accordance with subsection (b)
15 of such section 9, except that paragraph (3)(B) of
16 that subsection shall not apply.

17 (d) UNDERGRADUATE EDUCATION PROGRAMS.—

18 (1) ACTIVITIES SUPPORTED.—As part of the
19 activities included under the Education and Societal
20 Dimensions program component area, or any suc-
21 cessor program component area, the Program shall
22 support efforts to introduce nanoscale science, engi-
23 neering, and technology into undergraduate science
24 and engineering education through a variety of

1 interdisciplinary approaches. Activities supported
2 may include—

3 (A) development of courses of instruction
4 or modules to existing courses;

5 (B) faculty professional development; and

6 (C) acquisition of equipment and instru-
7 mentation suitable for undergraduate education
8 and research in nanotechnology.

9 (2) COURSE, CURRICULUM, AND LABORATORY
10 IMPROVEMENT AUTHORIZATION.—There are author-
11 ized to be appropriated to the Director of the Na-
12 tional Science Foundation to carry out activities de-
13 scribed in paragraph (1) through the Course, Cur-
14 riculum, and Laboratory Improvement program—

15 (A) from amounts authorized under section
16 7002(b)(2)(B) of the America COMPETES
17 Act, \$5,000,000 for fiscal year 2009; and

18 (B) from amounts authorized under sec-
19 tion 7002(c)(2)(B) of the America COMPETES
20 Act, \$5,000,000 for fiscal year 2010.

21 (3) ADVANCED TECHNOLOGY EDUCATION AU-
22 THORIZATION.—There are authorized to be appro-
23 priated to the Director of the National Science
24 Foundation to carry out activities described in para-

1 graph (1) through the Advanced Technology Edu-
2 cation program—

3 (A) from amounts authorized under section
4 7002(b)(2)(B) of the America COMPETES
5 Act, \$5,000,000 for fiscal year 2009; and

6 (B) from amounts authorized under sec-
7 tion 7002(c)(2)(B) of the America COMPETES
8 Act, \$5,000,000 for fiscal year 2010.

9 (e) INTERAGENCY WORKING GROUP.—The National
10 Science and Technology Council shall establish under the
11 Nanoscale Science, Engineering, and Technology Sub-
12 committee an Education Working Group to coordinate,
13 prioritize, and plan the educational activities supported
14 under the Program.

15 **SEC. 4. TECHNOLOGY TRANSFER.**

16 (a) PROTOTYPING.—

17 (1) ACCESS TO FACILITIES.—In accordance
18 with section 2(b)(7) of 21st Century Nanotechnology
19 Research and Development Act (15 U.S.C.
20 7501(b)(7)), the agencies supporting nanotechnology
21 research facilities as part of the Program shall pro-
22 vide access to such facilities to companies for the
23 purpose of assisting the companies in the develop-
24 ment of prototypes of nanoscale products, devices, or
25 processes (or products, devices, or processes enabled

1 by nanotechnology) for determining proof of concept.
2 The agencies shall publicize the availability of these
3 facilities and encourage their use by companies as
4 provided for in this section.

5 (2) PROCEDURES.—The agencies identified in
6 paragraph (1)—

7 (A) shall establish and publish procedures,
8 guidelines, and conditions for the submission
9 and approval of applications for use of
10 nanotechnology facilities;

11 (B) shall publish descriptions of the capa-
12 bilities of facilities available for use under this
13 subsection, including the availability of tech-
14 nical support; and

15 (C) may waive recovery, require full recov-
16 ery, or require partial recovery of the costs as-
17 sociated with use of the facilities for projects
18 under this subsection.

19 (3) SELECTION AND CRITERIA.—In cases when
20 less than full cost recovery is required pursuant to
21 paragraph (2)(C), projects provided access to
22 nanotechnology facilities in accordance with this sub-
23 section shall be selected through a competitive,
24 merit-based process, and the criteria for the selec-
25 tion of such projects shall include at a minimum—

1 (A) the readiness of the project for tech-
2 nology demonstration;

3 (B) evidence of a commitment by the ap-
4 plicant for further development of the project to
5 full commercialization if the proof of concept is
6 established by the prototype; and

7 (C) evidence of the potential for further
8 funding from private sector sources following
9 the successful demonstration of proof of con-
10 cept.

11 The agencies may give special consideration in se-
12 lecting projects to applications that are relevant to
13 important national needs or requirements.

14 (b) USE OF EXISTING TECHNOLOGY TRANSFER PRO-
15 GRAMS.—

16 (1) PARTICIPATING AGENCIES.—Each agency
17 participating in the Program shall—

18 (A) encourage the submission of applica-
19 tions for support of nanotechnology related
20 projects to the Small Business Innovation Re-
21 search Program and the Small Business Tech-
22 nology Transfer Program administered by such
23 agencies; and

24 (B) through the National Nanotechnology
25 Coordination Office and within 6 months after

1 the date of enactment of this Act, submit to the
2 Committee on Commerce, Science, and Trans-
3 portation of the Senate and the Committee on
4 Science and Technology of the House of Rep-
5 resentatives—

6 (i) the plan described in section
7 2(c)(7) of the 21st Century Nanotechnol-
8 ogy Research and Development Act (15
9 U.S.C. 7501(c)(7)); and

10 (ii) a report specifying, if the agency
11 administers a Small Business Innovation
12 Research Program and a Small Business
13 Technology Transfer Program—

14 (I) the number of proposals re-
15 ceived for nanotechnology related
16 projects during the current fiscal year
17 and the previous 2 fiscal years;

18 (II) the number of such pro-
19 posals funded in each year;

20 (III) the total number of
21 nanotechnology related projects fund-
22 ed and the amount of funding pro-
23 vided for fiscal year 2003 through fis-
24 cal year 2007; and

1 (IV) a description of the projects
2 identified in accordance with sub-
3 clause (III) which received private sec-
4 tor funding beyond the period of
5 phase II support.

6 (2) NATIONAL INSTITUTE OF STANDARDS AND
7 TECHNOLOGY.—The Director of the National Insti-
8 tute of Standards and Technology in carrying out
9 the requirements of section 28 of the National Insti-
10 tute of Standards and Technology Act (15 U.S.C.
11 278n) shall—

12 (A) in regard to subsection (d) of that sec-
13 tion, encourage the submission of proposals for
14 support of nanotechnology related projects; and

15 (B) in regard to subsection (g) of that sec-
16 tion, include a description of how the require-
17 ment of subparagraph (A) of this paragraph is
18 being met, the number of proposals for
19 nanotechnology related projects received, the
20 number of such proposals funded, the total
21 number of such projects funded since the begin-
22 ning of the Technology Innovation Program,
23 and the outcomes of such funded projects in
24 terms of the metrics developed in accordance
25 with such subsection (g).

1 (3) TIP ADVISORY BOARD.—The TIP Advisory
2 Board established under section 28(k) of the Na-
3 tional Institute of Standards and Technology Act
4 (15 U.S.C. 278n(k)), in carrying out its responsibil-
5 ities under subsection (k)(3), shall provide the Di-
6 rector of the National Institute of Standards and
7 Technology with—

8 (A) advice on how to accomplish the re-
9 quirement of paragraph (2)(A) of this sub-
10 section; and

11 (B) an assessment of the adequacy of the
12 allocation of resources for nanotechnology re-
13 lated projects supported under the Technology
14 Innovation Program.

15 (c) INDUSTRY LIAISON GROUPS.—An objective of the
16 Program shall be to establish industry liaison groups for
17 all industry sectors that would benefit from applications
18 of nanotechnology. The Nanomanufacturing, Industry Li-
19 aision, and Innovation Working Group of the National
20 Science and Technology Council shall actively pursue es-
21 tablishing such liaison groups.

22 (d) COORDINATION WITH STATE INITIATIVES.—Sec-
23 tion 2(b)(5) of the 21st Century Nanotechnology Research
24 and Development Act (15 U.S.C. 7501(b)(5)) is amended
25 to read as follows:

1 “(5) ensuring United States global leadership in
2 the development and application of nanotechnology,
3 including through coordination and leveraging Fed-
4 eral investments with nanotechnology research, de-
5 velopment, and technology transition initiatives sup-
6 ported by the States;”.

7 **SEC. 5. RESEARCH IN AREAS OF NATIONAL IMPORTANCE.**

8 (a) IN GENERAL.—The Program shall include sup-
9 port for nanotechnology research and development activi-
10 ties directed toward application areas that have the poten-
11 tial for significant contributions to national economic com-
12 petitiveness and for other significant societal benefits. The
13 activities supported shall be designed to advance the devel-
14 opment of research discoveries by demonstrating technical
15 solutions to important problems in such areas as nano-
16 electronics, energy efficiency, health care, and water reme-
17 diation and purification. The Advisory Panel shall make
18 recommendations to the Program for candidate research
19 and development areas for support under this section.

20 (b) CHARACTERISTICS.—

21 (1) IN GENERAL.—Research and development
22 activities under this section shall—

23 (A) include projects selected on the basis
24 of applications for support through a competi-
25 tive, merit-based process;

1 (B) involve collaborations among research-
2 ers in academic institutions and industry, and
3 may involve nonprofit research institutions and
4 Federal laboratories, as appropriate;

5 (C) when possible, leverage Federal invest-
6 ments through collaboration with related State
7 initiatives; and

8 (D) include a plan for fostering the trans-
9 fer of research discoveries and the results of
10 technology demonstration activities to industry
11 for commercial development.

12 (2) PROCEDURES.—Determination of the re-
13 quirements for applications under this subsection,
14 review and selection of applications for support, and
15 subsequent funding of projects shall be carried out
16 by a collaboration of no fewer than 2 agencies par-
17 ticipating in the Program. In selecting applications
18 for support, the agencies shall give special consider-
19 ation to projects that include cost sharing from non-
20 Federal sources.

21 (3) INTERDISCIPLINARY RESEARCH CENTERS.—
22 Research and development activities under this sec-
23 tion may be supported through interdisciplinary
24 nanotechnology research centers, as authorized by
25 section 2(b)(4) of the 21st Century Nanotechnology

1 Research and Development Act (15 U.S.C.
2 7501(b)(4)), that are organized to investigate basic
3 research questions and carry out technology dem-
4 onstration activities in areas such as those identified
5 in subsection (a).

6 (c) REPORT.—Reports required under section 2(d) of
7 the 21st Century Nanotechnology Research and Develop-
8 ment Act (15 U.S.C. 7501(d)) shall include a description
9 of research and development areas supported in accord-
10 ance with this section, including the same budget informa-
11 tion as is required for program component areas under
12 paragraphs (1) and (2) of such section 2(d).

13 **SEC. 6. NANOMANUFACTURING RESEARCH.**

14 (a) RESEARCH AREAS.—The Nanomanufacturing
15 program component area, or any successor program com-
16 ponent area, shall include research on—

17 (1) development of instrumentation and tools
18 required for the rapid characterization of nanoscale
19 materials and for monitoring of nanoscale manufac-
20 turing processes; and

21 (2) approaches and techniques for scaling the
22 synthesis of new nanoscale materials to achieve in-
23 dustrial-level production rates.

24 (b) GREEN NANOTECHNOLOGY.—Interdisciplinary re-
25 search centers supported under the Program in accord-

1 ance with section 2(b)(4) of the 21st Century
2 Nanotechnology Research and Development Act (15
3 U.S.C. 7501(b)(4)) that are focused on nanomanufactur-
4 ing research and centers established under the authority
5 of section 5(b)(3) of this Act shall include as part of the
6 activities of such centers—

7 (1) research on methods and approaches to de-
8 velop environmentally benign nanoscale products and
9 nanoscale manufacturing processes, taking into con-
10 sideration relevant findings and results of research
11 supported under the Environmental, Health, and
12 Safety program component area, or any successor
13 program component area;

14 (2) fostering the transfer of the results of such
15 research to industry; and

16 (3) providing for the education of scientists and
17 engineers through interdisciplinary studies in the
18 principles and techniques for the design and develop-
19 ment of environmentally benign nanoscale products
20 and processes.

21 (c) REVIEW OF NANOMANUFACTURING RESEARCH
22 AND RESEARCH FACILITIES.—

23 (1) PUBLIC MEETING.—Not later than 12
24 months after the date of enactment of this Act, the
25 National Nanotechnology Coordination Office shall

1 sponsor a public meeting, including representation
2 from a wide range of industries engaged in nano-
3 scale manufacturing, to—

4 (A) obtain the views of participants at the
5 meeting on—

6 (i) the relevance and value of the re-
7 search being carried out under the Nano-
8 manufacturing program component area of
9 the Program, or any successor program
10 component area; and

11 (ii) whether the capabilities of
12 nanotechnology research facilities sup-
13 ported under the Program are adequate to
14 meet current and near-term requirements
15 for the fabrication and characterization of
16 nanoscale devices and systems; and

17 (B) receive any recommendations on ways
18 to strengthen the research portfolio supported
19 under the Nanomanufacturing program compo-
20 nent area, or any successor program component
21 area, and on improving the capabilities of
22 nanotechnology research facilities supported
23 under the Program.

24 Companies participating in industry liaison groups
25 shall be invited to participate in the meeting. The

1 Coordination Office shall prepare a report docu-
2 menting the findings and recommendations resulting
3 from the meeting.

4 (2) ADVISORY PANEL REVIEW.—The Advisory
5 Panel shall review the Nanomanufacturing program
6 component area of the Program, or any successor
7 program component area, and the capabilities of
8 nanotechnology research facilities supported under
9 the Program to assess—

10 (A) whether the funding for the
11 Nanomanufacturing program component area,
12 or any successor program component area, is
13 adequate and receiving appropriate priority
14 within the overall resources available for the
15 Program;

16 (B) the relevance of the research being
17 supported to the identified needs and require-
18 ments of industry;

19 (C) whether the capabilities of
20 nanotechnology research facilities supported
21 under the Program are adequate to meet cur-
22 rent and near-term requirements for the fab-
23 rication and characterization of nanoscale de-
24 vices and systems; and

1 (D) the level of funding that would be
2 needed to support—

3 (i) the acquisition of instrumentation
4 and equipment sufficient to provide the ca-
5 pabilities at nanotechnology research facili-
6 ties described in subparagraph (C); and

7 (ii) the operation and maintenance of
8 such facilities.

9 In carrying out its assessment, the Advisory Panel
10 shall take into consideration the findings and rec-
11 ommendations from the report required under para-
12 graph (1).

13 (3) REPORT.—Not later than 18 months after
14 the date of enactment of this Act, the Advisory
15 Panel shall submit to the Committee on Commerce,
16 Science, and Transportation of the Senate and the
17 Committee on Science and Technology of the House
18 of Representatives a report on its assessment re-
19 quired under paragraph (2), along with any rec-
20 ommendations and a copy of the report prepared in
21 accordance with paragraph (1).

22 **SEC. 7. DEFINITIONS.**

23 In this Act, terms that are defined in section 10 of
24 the 21st Century Nanotechnology Research and Develop-

1 ment Act (15 U.S.C. 7509) have the meaning given those
2 terms in that section.

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