

111TH CONGRESS
1ST SESSION

H. R. 554

IN THE SENATE OF THE UNITED STATES

FEBRUARY 12, 2009

Received; read twice and referred to the Committee on Commerce, Science,
and Transportation

AN ACT

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,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “National Nanotechnol-
3 ogy Initiative Amendments Act of 2009”.

4 **SEC. 2. NATIONAL NANOTECHNOLOGY PROGRAM AMEND-**
5 **MENTS.**

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

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

10 “(4) develop, within 12 months after the date
11 of enactment of the National Nanotechnology Initia-
12 tive Amendments Act of 2009, and update every 3
13 years thereafter, a strategic plan to guide the activi-
14 ties described under subsection (b) that specifies
15 near-term and long-term objectives for the Program,
16 the anticipated time frame for achieving the near-
17 term objectives, and the metrics to be used for as-
18 sessing progress toward the objectives, and that de-
19 scribes—

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

1 “(B) how the Program will encourage and
2 support interdisciplinary research and develop-
3 ment in nanotechnology; and

4 “(C) proposed research in areas of national
5 importance in accordance with the requirements
6 of section 5 of the National Nanotechnology
7 Initiative Amendments Act of 2009;”;

8 (2) in section 2—

9 (A) in subsection (d)—

10 (i) by redesignating paragraphs (1)
11 through (5) as paragraphs (2) through (6),
12 respectively; and

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

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

24 (B) by inserting at the end the following
25 new subsection:

1 “(e) STANDARDS SETTING.—The agencies partici-
2 pating in the Program shall support the activities of com-
3 mittees involved in the development of standards for nano-
4 technology and may reimburse the travel costs of scientists
5 and engineers who participate in activities of such commit-
6 tees.”;

7 (3) by striking section 3(b) and inserting the
8 following new subsection:

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

17 “(2) The annual report under section 2(d) shall in-
18 clude—

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

1 “(B) a description of the funding required by
2 such Office to perform the functions specified under
3 subsection (a) for the current fiscal year by category
4 of activity, including the funding required to carry
5 out the requirements of subsection (d); and

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

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

11 “(d) PUBLIC INFORMATION.—(1) The National
12 Nanotechnology Coordination Office shall develop and
13 maintain a database accessible by the public of projects
14 funded under the Environmental, Health, and Safety, the
15 Education and Societal Dimensions, and the Nanomanu-
16 facturing program component areas, or any successor pro-
17 gram component areas, including a description of each
18 project, its source of funding by agency, and its funding
19 history. For the Environmental, Health, and Safety pro-
20 gram component area, or any successor program compo-
21 nent area, projects shall be grouped by major objective as
22 defined by the research plan required under section 3(b)
23 of the National Nanotechnology Initiative Amendments
24 Act of 2009. For the Education and Societal Dimensions
25 program component area, or any successor program com-

1 ponent area, the projects shall be grouped in subcategories
2 of—

3 “(A) education in formal settings;

4 “(B) education in informal settings;

5 “(C) public outreach; and

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

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

18 (5) in section 4(a)—

19 (A) by striking “or designate”;

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

22 (C) by inserting at the end “The Advisory
23 Panel shall form a subpanel with membership
24 having specific qualifications tailored to enable

1 it to carry out the requirements of subsection
2 (e)(7).”;

3 (6) in section 4(b)—

4 (A) by striking “or designated” and “or
5 designating”;

6 (B) by adding at the end the following:

7 “At least one member of the Advisory Panel
8 shall be an individual employed by and rep-
9 resenting a minority-serving institution.”;

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

11 **“SEC. 5. TRIENNIAL EXTERNAL REVIEW OF THE NATIONAL**

12 **NANOTECHNOLOGY PROGRAM.**

13 “(a) IN GENERAL.—The Director of the National
14 Nanotechnology Coordination Office shall enter into an ar-
15 rangement with the National Research Council of the Na-
16 tional Academy of Sciences to conduct a triennial review
17 of the Program. The Director shall ensure that the ar-
18 rangement with the National Research Council is con-
19 cluded in order to allow sufficient time for the reporting
20 requirements of subsection (b) to be satisfied. Each tri-
21 ennial review shall include an evaluation of the—

22 “(1) research priorities and technical content of
23 the Program, including whether the allocation of
24 funding among program component areas, as des-
25 ignated according to section 2(c)(2), is appropriate;

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

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

8 “(4) adequacy of the Program’s activities ad-
9 dressing ethical, legal, environmental, and other ap-
10 propriate societal concerns, including human health
11 concerns.

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

1 every third year, with the first report due September 30,
2 2010.

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

6 “(1) \$500,000 for fiscal year 2010.

7 “(2) \$500,000 for fiscal year 2011.

8 “(3) \$500,000 for fiscal year 2012.”; and

9 (8) in section 10—

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

12 “(2) NANOTECHNOLOGY.—The term ‘nanotech-
13 nology’ means the science and technology that will
14 enable one to understand, measure, manipulate, and
15 manufacture at the nanoscale, aimed at creating ma-
16 terials, devices, and systems with fundamentally new
17 properties or functions.”; and

18 (B) by adding at the end the following new
19 paragraph:

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

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

24 (a) COORDINATOR FOR SOCIETAL DIMENSIONS OF
25 NANOTECHNOLOGY.—The Director of the Office of

1 Science and Technology Policy shall designate an associate
2 director of the Office of Science and Technology Policy
3 as the Coordinator for Societal Dimensions of Nanotech-
4 nology. The Coordinator shall be responsible for oversight
5 of the coordination, planning, and budget prioritization of
6 activities required by section 2(b)(10) of the 21st Century
7 Nanotechnology Research and Development Act (15
8 U.S.C. 7501(b)(10)). The Coordinator shall, with the as-
9 sistance of appropriate senior officials of the agencies
10 funding activities within the Environmental, Health, and
11 Safety and the Education and Societal Dimensions pro-
12 gram component areas of the Program, or any successor
13 program component areas, ensure that the requirements
14 of such section 2(b)(10) are satisfied. The responsibilities
15 of the Coordinator shall include—

16 (1) ensuring that a research plan for the envi-
17 ronmental, health, and safety research activities re-
18 quired under subsection (b) is developed, updated,
19 and implemented and that the plan is responsive to
20 the recommendations of the subpanel of the Advi-
21 sory Panel established under section 4(a) of the 21st
22 Century Nanotechnology Research and Development
23 Act (15 U.S.C. 7503(a)), as amended by this Act;

24 (2) encouraging and monitoring the efforts of
25 the agencies participating in the Program to allocate

1 the level of resources and management attention
2 necessary to ensure that the ethical, legal, environ-
3 mental, and other appropriate societal concerns re-
4 lated to nanotechnology, including human health
5 concerns, are addressed under the Program, includ-
6 ing the implementation of the research plan de-
7 scribed in subsection (b); and

8 (3) encouraging the agencies required to de-
9 velop the research plan under subsection (b) to iden-
10 tify, assess, and implement suitable mechanisms for
11 the establishment of public-private partnerships for
12 support of environmental, health, and safety re-
13 search.

14 (b) RESEARCH PLAN.—

15 (1) IN GENERAL.—The Coordinator for Societal
16 Dimensions of Nanotechnology shall convene and
17 chair a panel comprised of representatives from the
18 agencies funding research activities under the Envi-
19 ronmental, Health, and Safety program component
20 area of the Program, or any successor program com-
21 ponent area, and from such other agencies as the
22 Coordinator considers necessary to develop, periodi-
23 cally update, and coordinate the implementation of
24 a research plan for this program component area. In
25 developing and updating the plan, the panel con-

1 vened by the Coordinator shall solicit and be respon-
2 sive to recommendations and advice from—

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

8 (B) the agencies responsible for environ-
9 mental, health, and safety regulations associ-
10 ated with the production, use, and disposal of
11 nanoscale materials and products.

12 (2) DEVELOPMENT OF STANDARDS.—The plan
13 required under paragraph (1) shall include a de-
14 scription of how the Program will help to ensure the
15 development of—

16 (A) standards related to nomenclature as-
17 sociated with engineered nanoscale materials;

18 (B) engineered nanoscale standard ref-
19 erence materials for environmental, health, and
20 safety testing; and

21 (C) standards related to methods and pro-
22 cedures for detecting, measuring, monitoring,
23 sampling, and testing engineered nanoscale ma-
24 terials for environmental, health, and safety im-
25 pacts.

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

4 (A) specify near-term research objectives
5 and long-term research objectives;

6 (B) specify milestones associated with each
7 near-term objective and the estimated time and
8 resources required to reach each milestone;

9 (C) with respect to subparagraphs (A) and
10 (B), describe the role of each agency carrying
11 out or sponsoring research in order to meet the
12 objectives specified under subparagraph (A) and
13 to achieve the milestones specified under sub-
14 paragraph (B);

15 (D) specify the funding allocated to each
16 major objective of the plan and the source of
17 funding by agency for the current fiscal year;
18 and

19 (E) estimate the funding required for each
20 major objective of the plan and the source of
21 funding by agency for the following 3 fiscal
22 years.

23 (4) TRANSMITTAL TO CONGRESS.—The plan re-
24 quired under paragraph (1) shall be submitted not
25 later than 60 days after the date of enactment of

1 this Act to the Committee on Commerce, Science,
2 and Transportation of the Senate and the Com-
3 mittee on Science and Technology of the House of
4 Representatives.

5 (5) UPDATING AND APPENDING TO REPORT.—

6 The plan required under paragraph (1) shall be up-
7 dated annually and appended to the report required
8 under section 2(d) of the 21st Century Nanotechnol-
9 ogy Research and Development Act (15 U.S.C.
10 7501(d)).

11 (c) NANOTECHNOLOGY PARTNERSHIPS.—

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

23 (2) PURPOSE.—Nanotechnology Education

24 Partnerships shall be designed to recruit and help
25 prepare secondary school students to pursue postsec-

1 ondary level courses of instruction in nanotechnol-
2 ogy. At a minimum, grants shall be used to sup-
3 port—

4 (A) professional development activities to
5 enable secondary school teachers to use cur-
6 ricular materials incorporating nanotechnology
7 and to inform teachers about career possibilities
8 for students in nanotechnology;

9 (B) enrichment programs for students, in-
10 cluding access to nanotechnology facilities and
11 equipment at partner institutions, to increase
12 their understanding of nanoscale science and
13 technology and to inform them about career
14 possibilities in nanotechnology as scientists, en-
15 gineers, and technicians; and

16 (C) identification of appropriate nanotech-
17 nology educational materials and incorporation
18 of nanotechnology into the curriculum for sec-
19 ondary school students at one or more organiza-
20 tions participating in a Partnership.

21 (3) SELECTION.—Grants under this subsection
22 shall be awarded in accordance with subsection (b)
23 of such section 9, except that paragraph (3)(B) of
24 that subsection shall not apply.

25 (d) UNDERGRADUATE EDUCATION PROGRAMS.—

1 (1) ACTIVITIES SUPPORTED.—As part of the
2 activities included under the Education and Societal
3 Dimensions program component area, or any suc-
4 cessor program component area, the Program shall
5 support efforts to introduce nanoscale science, engi-
6 neering, and technology into undergraduate science
7 and engineering education through a variety of
8 interdisciplinary approaches. Activities supported
9 may include—

10 (A) development of courses of instruction
11 or modules to existing courses;

12 (B) faculty professional development; and

13 (C) acquisition of equipment and instru-
14 mentation suitable for undergraduate education
15 and research in nanotechnology.

16 (2) COURSE, CURRICULUM, AND LABORATORY
17 IMPROVEMENT AUTHORIZATION.—There are author-
18 ized to be appropriated to the Director of the Na-
19 tional Science Foundation to carry out activities de-
20 scribed in paragraph (1) through the Course, Cur-
21 riculum, and Laboratory Improvement program
22 from amounts authorized under section
23 7002(e)(2)(B) of the America COMPETES Act,
24 \$5,000,000 for fiscal year 2010.

1 (3) ADVANCED TECHNOLOGY EDUCATION AU-
2 THORIZATION.—There are authorized to be appro-
3 priated to the Director of the National Science
4 Foundation to carry out activities described in para-
5 graph (1) through the Advanced Technology Edu-
6 cation program from amounts authorized under sec-
7 tion 7002(c)(2)(B) of the America COMPETES Act,
8 \$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 (f) SOCIETAL DIMENSIONS IN NANOTECHNOLOGY
16 EDUCATION ACTIVITIES.—Activities supported under the
17 Education and Societal Dimensions program component
18 area, or any successor program component area, that in-
19 volve informal, precollege, or undergraduate nanotechnol-
20 ogy education shall include education regarding the envi-
21 ronmental, health and safety, and other societal aspects
22 of nanotechnology.

23 (g) REMOTE ACCESS TO NANOTECHNOLOGY FACILI-
24 TIES.—(1) Agencies supporting nanotechnology research
25 facilities as part of the Program shall require the entities

1 that operate such facilities to allow access via the Internet,
2 and support the costs associated with the provision of such
3 access, by secondary school students and teachers, to in-
4 struments and equipment within such facilities for edu-
5 cational purposes. The agencies may waive this require-
6 ment for cases when particular facilities would be inappro-
7 priate for educational purposes or the costs for providing
8 such access would be prohibitive.

9 (2) The agencies identified in paragraph (1) shall re-
10 quire the entities that operate such nanotechnology re-
11 search facilities to establish and publish procedures, guide-
12 lines, and conditions for the submission and approval of
13 applications for the use of the facilities for the purpose
14 identified in paragraph (1) and shall authorize personnel
15 who operate the facilities to provide necessary technical
16 support to students and teachers.

17 **SEC. 4. TECHNOLOGY TRANSFER.**

18 (a) **PROTOTYPING.**—

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

1 ment of prototypes of nanoscale products, devices, or
2 processes (or products, devices, or processes enabled
3 by nanotechnology) for determining proof of concept.
4 The agencies shall publicize the availability of these
5 facilities and encourage their use by companies as
6 provided for in this section.

7 (2) PROCEDURES.—The agencies identified in
8 paragraph (1)—

9 (A) shall establish and publish procedures,
10 guidelines, and conditions for the submission
11 and approval of applications for use of nano-
12 technology facilities;

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

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

21 (3) SELECTION AND CRITERIA.—In cases when
22 less than full cost recovery is required pursuant to
23 paragraph (2)(C), projects provided access to nano-
24 technology facilities in accordance with this sub-
25 section shall be selected through a competitive,

1 merit-based process, and the criteria for the selec-
2 tion of such projects shall include at a minimum—

3 (A) the readiness of the project for tech-
4 nology demonstration;

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

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

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

16 (b) USE OF EXISTING TECHNOLOGY TRANSFER PRO-
17 GRAMS.—

18 (1) PARTICIPATING AGENCIES.—Each agency
19 participating in the Program shall—

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

1 (B) through the National Nanotechnology
2 Coordination Office and within 6 months after
3 the date of enactment of this Act, submit to the
4 Committee on Commerce, Science, and Trans-
5 portation of the Senate and the Committee on
6 Science and Technology of the House of Rep-
7 resentatives—

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

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

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

20 (II) the number of such pro-
21 posals funded in each year;

22 (III) the total number of nano-
23 technology related projects funded and
24 the amount of funding provided for

1 fiscal year 2004 through fiscal year
2 2008; and

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

8 (2) NATIONAL INSTITUTE OF STANDARDS AND
9 TECHNOLOGY.—The Director of the National Insti-
10 tute of Standards and Technology in carrying out
11 the requirements of section 28 of the National Insti-
12 tute of Standards and Technology Act (15 U.S.C.
13 278n) shall—

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

17 (B) in regard to subsection (g) of that sec-
18 tion, include a description of how the require-
19 ment of subparagraph (A) of this paragraph is
20 being met, the number of proposals for nano-
21 technology related projects received, the number
22 of such proposals funded, the total number of
23 such projects funded since the beginning of the
24 Technology Innovation Program, and the out-
25 comes of such funded projects in terms of the

1 metrics developed in accordance with such sub-
2 section (g).

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

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

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

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

24 (d) COORDINATION WITH STATE INITIATIVES.—Sec-
25 tion 2(b)(5) of the 21st Century Nanotechnology Research

1 and Development Act (15 U.S.C. 7501(b)(5)) is amended
2 to read as follows:

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

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

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

22 (b) CHARACTERISTICS.—

23 (1) IN GENERAL.—Research and development
24 activities under this section shall—

1 (A) include projects selected on the basis
2 of applications for support through a competi-
3 tive, merit-based process;

4 (B) involve collaborations among research-
5 ers in academic institutions and industry, and
6 may involve nonprofit research institutions and
7 Federal laboratories, as appropriate;

8 (C) when possible, leverage Federal invest-
9 ments through collaboration with related State
10 initiatives; and

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

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

24 (3) INTERDISCIPLINARY RESEARCH CENTERS.—
25 Research and development activities under this sec-

1 tion may be supported through interdisciplinary
2 nanotechnology research centers, as authorized by
3 section 2(b)(4) of the 21st Century Nanotechnology
4 Research and Development Act (15 U.S.C.
5 7501(b)(4)), that are organized to investigate basic
6 research questions and carry out technology dem-
7 onstration activities in areas such as those identified
8 in subsection (a).

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

16 **SEC. 6. NANOMANUFACTURING RESEARCH.**

17 (a) RESEARCH AREAS.—The Nanomanufacturing
18 program component area, or any successor program com-
19 ponent area, shall include research on—

20 (1) development of instrumentation and tools
21 required for the rapid characterization of nanoscale
22 materials and for monitoring of nanoscale manufac-
23 turing processes; and

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

4 (b) GREEN NANOTECHNOLOGY.—Interdisciplinary re-
5 search centers supported under the Program in accord-
6 ance with section 2(b)(4) of the 21st Century Nanotech-
7 nology Research and Development Act (15 U.S.C.
8 7501(b)(4)) that are focused on nanomanufacturing re-
9 search and centers established under the authority of sec-
10 tion 5(b)(3) of this Act shall include as part of the activi-
11 ties of such centers—

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

19 (2) fostering the transfer of the results of such
20 research to industry; and

21 (3) providing for the education of scientists and
22 engineers through interdisciplinary studies in the
23 principles and techniques for the design and develop-
24 ment of environmentally benign nanoscale products
25 and processes.

1 (c) REVIEW OF NANOMANUFACTURING RESEARCH
2 AND RESEARCH FACILITIES.—

3 (1) PUBLIC MEETING.—Not later than 12
4 months after the date of enactment of this Act, the
5 National Nanotechnology Coordination Office shall
6 sponsor a public meeting, including representation
7 from a wide range of industries engaged in
8 nanoscale manufacturing, to—

9 (A) obtain the views of participants at the
10 meeting on—

11 (i) the relevance and value of the re-
12 search being carried out under the Nano-
13 manufacturing program component area of
14 the Program, or any successor program
15 component area; and

16 (ii) whether the capabilities of nano-
17 technology research facilities supported
18 under the Program are adequate—

19 (I) to meet current and near-
20 term requirements for the fabrication
21 and characterization of nanoscale de-
22 vices and systems; and

23 (II) to provide access to and use
24 of instrumentation and equipment at
25 the facilities, by means of networking

1 technology, to individuals who are at
2 locations remote from the facilities;
3 and

4 (B) receive any recommendations on ways
5 to strengthen the research portfolio supported
6 under the Nanomanufacturing program compo-
7 nent area, or any successor program component
8 area, and on improving the capabilities of nano-
9 technology research facilities supported under
10 the Program.

11 Companies participating in industry liaison groups
12 shall be invited to participate in the meeting. The
13 Coordination Office shall prepare a report docu-
14 menting the findings and recommendations resulting
15 from the meeting.

16 (2) ADVISORY PANEL REVIEW.—The Advisory
17 Panel shall review the Nanomanufacturing program
18 component area of the Program, or any successor
19 program component area, and the capabilities of
20 nanotechnology research facilities supported under
21 the Program to assess—

22 (A) whether the funding for the Nano-
23 manufacturing program component area, or any
24 successor program component area, is adequate

1 and receiving appropriate priority within the
2 overall resources available for the Program;

3 (B) the relevance of the research being
4 supported to the identified needs and require-
5 ments of industry;

6 (C) whether the capabilities of nanotech-
7 nology research facilities supported under the
8 Program are adequate—

9 (i) to meet current and near-term re-
10 quirements for the fabrication and charac-
11 terization of nanoscale devices and sys-
12 tems; and

13 (ii) to provide access to and use of in-
14 strumentation and equipment at the facili-
15 ties, by means of networking technology, to
16 individuals who are at locations remote
17 from the facilities; and

18 (D) the level of funding that would be
19 needed to support—

20 (i) the acquisition of instrumentation,
21 equipment, and networking technology suf-
22 ficient to provide the capabilities at nano-
23 technology research facilities described in
24 subparagraph (C); and

1 (ii) the operation and maintenance of
2 such facilities.

3 In carrying out its assessment, the Advisory Panel
4 shall take into consideration the findings and rec-
5 ommendations from the report required under para-
6 graph (1).

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

16 **SEC. 7. DEFINITIONS.**

17 In this Act, terms that are defined in section 10 of
18 the 21st Century Nanotechnology Research and Develop-
19 ment Act (15 U.S.C. 7509) have the meaning given those
20 terms in that section.

Passed the House of Representatives February 11,
2009.

Attest: LORRAINE C. MILLER,
Clerk.