

Union Calendar No. 427

110TH CONGRESS
2D SESSION

H. R. 5940

[Report No. 110-682]

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

JUNE 4, 2008

Additional sponsors: Mr. CARNAHAN, Mr. HONDA, Mr. MCNERNEY, Mr. HILL, Mr. JOHNSON of Illinois, Mr. FORTUÑO, and Mr. GONZALEZ

JUNE 4, 2008

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in italic]

[For text of introduced bill, see copy of bill as introduced on May 1, 2008]

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”.*

6 **SEC. 2. NATIONAL NANOTECHNOLOGY PROGRAM AMEND-**
7 **MENTS.**

8 *The 21st Century Nanotechnology Research and Devel-*
9 *opment Act (15 U.S.C. 7501 et seq.) is amended—*

10 *(1) by striking section 2(c)(4) and inserting the*
11 *following new paragraph:*

12 *“(4) develop, within 12 months after the date of*
13 *enactment of the National Nanotechnology Initiative*
14 *Amendments Act of 2008, and update every 3 years*
15 *thereafter, a strategic plan to guide the activities de-*
16 *scribed under subsection (b) that specifies near-term*
17 *and long-term objectives for the Program, the antici-*
18 *ipated time frame for achieving the near-term objec-*

1 *tives, and the metrics to be used for assessing progress*
2 *toward the objectives, and that describes—*

3 *“(A) how the Program will move results out*
4 *of the laboratory and into applications for the*
5 *benefit of society, including through cooperation*
6 *and collaborations with nanotechnology research,*
7 *development, and technology transition initia-*
8 *tives supported by the States;*

9 *“(B) how the Program will encourage and*
10 *support interdisciplinary research and develop-*
11 *ment in nanotechnology; and*

12 *“(C) proposed research in areas of national*
13 *importance in accordance with the requirements*
14 *of section 5 of the National Nanotechnology Ini-*
15 *tiative Amendments Act of 2008;”;*

16 *(2) in section 2—*

17 *(A) in subsection (d)—*

18 *(i) by redesignating paragraphs (1)*
19 *through (5) as paragraphs (2) through (6),*
20 *respectively; and*

21 *(ii) by inserting the following new*
22 *paragraph before paragraph (2), as so re-*
23 *designated by clause (i) of this subpara-*
24 *graph:*

1 “(1) the Program budget, for the previous fiscal
2 year, for each agency that participates in the Pro-
3 gram, including a breakout of spending for the devel-
4 opment and acquisition of research facilities and in-
5 strumentation, for each program component area, and
6 for all activities pursuant to subsection (b)(10);”;

7 (B) by inserting at the end the following
8 new subsection:

9 “(e) *STANDARDS SETTING.*—The agencies partici-
10 pating in the Program shall support the activities of com-
11 mittees involved in the development of standards for
12 nanotechnology and may reimburse the travel costs of sci-
13 entists and engineers who participate in activities of such
14 committees.”;

15 (3) by striking section 3(b) and inserting the fol-
16 lowing new subsection:

17 “(b) *FUNDING.*—(1) The operation of the National
18 Nanotechnology Coordination Office shall be supported by
19 funds from each agency participating in the Program. The
20 portion of such Office’s total budget provided by each agen-
21 cy for each fiscal year shall be in the same proportion as
22 the agency’s share of the total budget for the Program for
23 the previous fiscal year, as specified in the report required
24 under section 2(d)(1).

1 “(2) *The annual report under section 2(d) shall in-*
2 *clude—*

3 “(A) *a description of the funding required by the*
4 *National Nanotechnology Coordination Office to per-*
5 *form the functions specified under subsection (a) for*
6 *the next fiscal year by category of activity, including*
7 *the funding required to carry out the requirements of*
8 *section 2(b)(10)(D), subsection (d) of this section, and*
9 *section 5;*

10 “(B) *a description of the funding required by*
11 *such Office to perform the functions specified under*
12 *subsection (a) for the current fiscal year by category*
13 *of activity, including the funding required to carry*
14 *out the requirements of subsection (d); and*

15 “(C) *the amount of funding provided for such*
16 *Office for the current fiscal year by each agency par-*
17 *ticipating in the Program.”;*

18 “(4) *by inserting at the end of section 3 the fol-*
19 *lowing new subsection:*

20 “(d) *PUBLIC INFORMATION.—(1) The National*
21 *Nanotechnology Coordination Office shall develop and*
22 *maintain a database accessible by the public of projects*
23 *funded under the Environmental, Health, and Safety, the*
24 *Education and Societal Dimensions, and the Nanomanu-*
25 *facturing program component areas, or any successor pro-*

1 *gram component areas, including a description of each*
2 *project, its source of funding by agency, and its funding*
3 *history. For the Environmental, Health, and Safety pro-*
4 *gram component area, or any successor program component*
5 *area, projects shall be grouped by major objective as defined*
6 *by the research plan required under section 3(b) of the Na-*
7 *tional Nanotechnology Initiative Amendments Act of 2008.*
8 *For the Education and Societal Dimensions program com-*
9 *ponent area, or any successor program component area, the*
10 *projects shall be grouped in subcategories of—*

11 *“(A) education in formal settings;*

12 *“(B) education in informal settings;*

13 *“(C) public outreach; and*

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

15 *“(2) The National Nanotechnology Coordination Office*
16 *shall develop, maintain, and publicize information on*
17 *nanotechnology facilities supported under the Program, and*
18 *may include information on nanotechnology facilities sup-*
19 *ported by the States, that are accessible for use by individ-*
20 *uals from academic institutions and from industry. The in-*
21 *formation shall include at a minimum the terms and condi-*
22 *tions for the use of each facility, a description of the capa-*
23 *bilities of the instruments and equipment available for use*
24 *at the facility, and a description of the technical support*
25 *available to assist users of the facility.”;*

1 (5) in section 4(a)—

2 (A) by striking “or designate”;

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

5 (C) by inserting at the end “The Advisory
6 Panel shall form a subpanel with membership
7 having specific qualifications tailored to enable
8 it to carry out the requirements of subsection
9 (c)(7).”;

10 (6) in section 4(b)—

11 (A) by striking “or designated” and “or
12 designating”; and

13 (B) by adding at the end the following: “At
14 least one member of the Advisory Panel shall be
15 an individual employed by and representing a
16 minority-serving institution.”;

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

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

19 **NANOTECHNOLOGY PROGRAM.**

20 “(a) *IN GENERAL.*—The Director of the National
21 Nanotechnology Coordination Office shall enter into an ar-
22 rangement with the National Research Council of the Na-
23 tional Academy of Sciences to conduct a triennial review
24 of the Program. The Director shall ensure that the arrange-
25 ment with the National Research Council is concluded in

1 *order to allow sufficient time for the reporting requirements*
2 *of subsection (b) to be satisfied. Each triennial review shall*
3 *include an evaluation of the—*

4 “(1) *research priorities and technical content of*
5 *the Program, including whether the allocation of*
6 *funding among program component areas, as des-*
7 *ignated according to section 2(c)(2), is appropriate;*

8 “(2) *effectiveness of the Program’s management*
9 *and coordination across agencies and disciplines, in-*
10 *cluding an assessment of the effectiveness of the Na-*
11 *tional Nanotechnology Coordination Office;*

12 “(3) *Program’s scientific and technological ac-*
13 *complishments and its success in transferring tech-*
14 *nology to the private sector; and*

15 “(4) *adequacy of the Program’s activities ad-*
16 *dressing ethical, legal, environmental, and other ap-*
17 *propriate societal concerns, including human health*
18 *concerns.*

19 “(b) *EVALUATION TO BE TRANSMITTED TO CON-*
20 *GRESS.—The National Research Council shall document the*
21 *results of each triennial review carried out in accordance*
22 *with subsection (a) in a report that includes any rec-*
23 *ommendations for ways to improve the Program’s manage-*
24 *ment and coordination processes and for changes to the Pro-*
25 *gram’s objectives, funding priorities, and technical content.*

1 *Each report shall be submitted to the Director of the Na-*
2 *tional Nanotechnology Coordination Office, who shall trans-*
3 *mit it to the Advisory Panel, the Committee on Commerce,*
4 *Science, and Transportation of the Senate, and the Com-*
5 *mittee on Science and Technology of the House of Rep-*
6 *resentatives not later than September 30 of every third year,*
7 *with the first report due September 30, 2009.*

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

11 “(1) *\$500,000 for fiscal year 2009.*

12 “(2) *\$500,000 for fiscal year 2010.*

13 “(3) *\$500,000 for fiscal year 2011.*”; and

14 (8) *in section 10—*

15 (A) *by amending paragraph (2) to read as*
16 *follows:*

17 “(2) *NANOTECHNOLOGY.*—*The term ‘nanotech-*
18 *nology’ means the science and technology that will en-*
19 *able one to understand, measure, manipulate, and*
20 *manufacture at the nanoscale, aimed at creating ma-*
21 *terials, devices, and systems with fundamentally new*
22 *properties or functions.*”; and

23 (B) *by adding at the end the following new*
24 *paragraph:*

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

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

5 (a) *COORDINATOR FOR SOCIETAL DIMENSIONS OF*
6 *NANOTECHNOLOGY*.—*The Director of the Office of Science*
7 *and Technology Policy shall designate an associate director*
8 *of the Office of Science and Technology Policy as the Coor-*
9 *dinator for Societal Dimensions of Nanotechnology. The Co-*
10 *ordinator shall be responsible for oversight of the coordina-*
11 *tion, planning, and budget prioritization of activities re-*
12 *quired by section 2(b)(10) of the 21st Century*
13 *Nanotechnology Research and Development Act (15 U.S.C.*
14 *7501(b)(10)). The Coordinator shall, with the assistance of*
15 *appropriate senior officials of the agencies funding activi-*
16 *ties within the Environmental, Health, and Safety and the*
17 *Education and Societal Dimensions program component*
18 *areas of the Program, or any successor program component*
19 *areas, ensure that the requirements of such section 2(b)(10)*
20 *are satisfied. The responsibilities of the Coordinator shall*
21 *include—*

22 (1) *ensuring that a research plan for the envi-*
23 *ronmental, health, and safety research activities re-*
24 *quired under subsection (b) is developed, updated, and*
25 *implemented and that the plan is responsive to the*

1 *recommendations of the subpanel of the Advisory*
2 *Panel established under section 4(a) of the 21st Cen-*
3 *tury Nanotechnology Research and Development Act*
4 *(15 U.S.C. 7503(a)), as amended by this Act;*

5 *(2) encouraging and monitoring the efforts of the*
6 *agencies participating in the Program to allocate the*
7 *level of resources and management attention necessary*
8 *to ensure that the ethical, legal, environmental, and*
9 *other appropriate societal concerns related to*
10 *nanotechnology, including human health concerns, are*
11 *addressed under the Program, including the imple-*
12 *mentation of the research plan described in subsection*
13 *(b); and*

14 *(3) encouraging the agencies required to develop*
15 *the research plan under subsection (b) to identify, as-*
16 *sess, and implement suitable mechanisms for the es-*
17 *tablishment of public-private partnerships for support*
18 *of environmental, health, and safety research.*

19 *(b) RESEARCH PLAN.—*

20 *(1) IN GENERAL.—The Coordinator for Societal*
21 *Dimensions of Nanotechnology shall convene and*
22 *chair a panel comprised of representatives from the*
23 *agencies funding research activities under the Envi-*
24 *ronmental, Health, and Safety program component*
25 *area of the Program, or any successor program com-*

1 *ponent area, and from such other agencies as the Co-*
2 *ordinator considers necessary to develop, periodically*
3 *update, and coordinate the implementation of a re-*
4 *search plan for this program component area. In de-*
5 *veloping and updating the plan, the panel convened*
6 *by the Coordinator shall solicit and be responsive to*
7 *recommendations and advice from—*

8 *(A) the subpanel of the Advisory Panel es-*
9 *tablished under section 4(a) of the 21st Century*
10 *Nanotechnology Research and Development Act*
11 *(15 U.S.C. 7503(a)), as amended by this Act;*
12 *and*

13 *(B) the agencies responsible for environ-*
14 *mental, health, and safety regulations associated*
15 *with the production, use, and disposal of*
16 *nanoscale materials and products.*

17 *(2) DEVELOPMENT OF STANDARDS.—The plan*
18 *required under paragraph (1) shall include a descrip-*
19 *tion of how the Program will help to ensure the devel-*
20 *opment of—*

21 *(A) standards related to nomenclature asso-*
22 *ciated with engineered nanoscale materials;*

23 *(B) engineered nanoscale standard reference*
24 *materials for environmental, health, and safety*
25 *testing; and*

1 (C) standards related to methods and proce-
2 dures for detecting, measuring, monitoring, sam-
3 pling, and testing engineered nanoscale mate-
4 rials for environmental, health, and safety im-
5 pacts.

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

9 (A) specify near-term research objectives
10 and long-term research objectives;

11 (B) specify milestones associated with each
12 near-term objective and the estimated time and
13 resources required to reach each milestone;

14 (C) with respect to subparagraphs (A) and
15 (B), describe the role of each agency carrying out
16 or sponsoring research in order to meet the objec-
17 tives specified under subparagraph (A) and to
18 achieve the milestones specified under subpara-
19 graph (B);

20 (D) specify the funding allocated to each
21 major objective of the plan and the source of
22 funding by agency for the current fiscal year;
23 and

24 (E) estimate the funding required for each
25 major objective of the plan and the source of

1 *funding by agency for the following 3 fiscal*
2 *years.*

3 (4) *TRANSMITTAL TO CONGRESS.—The plan re-*
4 *quired under paragraph (1) shall be submitted not*
5 *later than 60 days after the date of enactment of this*
6 *Act to the Committee on Commerce, Science, and*
7 *Transportation of the Senate and the Committee on*
8 *Science and Technology of the House of Representa-*
9 *tives.*

10 (5) *UPDATING AND APPENDING TO REPORT.—*
11 *The plan required under paragraph (1) shall be up-*
12 *dated annually and appended to the report required*
13 *under section 2(d) of the 21st Century Nanotechnol-*
14 *ogy Research and Development Act (15 U.S.C.*
15 *7501(d)).*

16 (c) *NANOTECHNOLOGY PARTNERSHIPS.—*

17 (1) *ESTABLISHMENT.—As part of the program*
18 *authorized by section 9 of the National Science Foun-*
19 *ation Authorization Act of 2002, the Director of the*
20 *National Science Foundation shall provide 1 or more*
21 *grants to establish partnerships as defined by sub-*
22 *section (a)(2) of that section, except that each such*
23 *partnership shall include 1 or more businesses en-*
24 *gaged in the production of nanoscale materials, prod-*
25 *ucts, or devices. Partnerships established in accord-*

1 *ance with this subsection shall be designated as*
2 *“Nanotechnology Education Partnerships”.*

3 (2) *PURPOSE.—Nanotechnology Education Part-*
4 *nerships shall be designed to recruit and help prepare*
5 *secondary school students to pursue postsecondary*
6 *level courses of instruction in nanotechnology. At a*
7 *minimum, grants shall be used to support—*

8 (A) *professional development activities to*
9 *enable secondary school teachers to use curricular*
10 *materials incorporating nanotechnology and to*
11 *inform teachers about career possibilities for stu-*
12 *dents in nanotechnology;*

13 (B) *enrichment programs for students, in-*
14 *cluding access to nanotechnology facilities and*
15 *equipment at partner institutions, to increase*
16 *their understanding of nanoscale science and*
17 *technology and to inform them about career pos-*
18 *sibilities in nanotechnology as scientists, engi-*
19 *neers, and technicians; and*

20 (C) *identification of appropriate nanotech-*
21 *nology educational materials and incorporation*
22 *of nanotechnology into the curriculum for sec-*
23 *ondary school students at one or more organiza-*
24 *tions participating in a Partnership.*

1 (3) *SELECTION.*—*Grants under this subsection*
2 *shall be awarded in accordance with subsection (b) of*
3 *such section 9, except that paragraph (3)(B) of that*
4 *subsection shall not apply.*

5 (d) *UNDERGRADUATE EDUCATION PROGRAMS.*—

6 (1) *ACTIVITIES SUPPORTED.*—*As part of the ac-*
7 *tivities included under the Education and Societal*
8 *Dimensions program component area, or any suc-*
9 *cessor program component area, the Program shall*
10 *support efforts to introduce nanoscale science, engi-*
11 *neering, and technology into undergraduate science*
12 *and engineering education through a variety of inter-*
13 *disciplinary approaches. Activities supported may in-*
14 *clude—*

15 (A) *development of courses of instruction or*
16 *modules to existing courses;*

17 (B) *faculty professional development; and*

18 (C) *acquisition of equipment and instru-*
19 *mentation suitable for undergraduate education*
20 *and research in nanotechnology.*

21 (2) *COURSE, CURRICULUM, AND LABORATORY IM-*
22 *PROVEMENT AUTHORIZATION.*—*There are authorized*
23 *to be appropriated to the Director of the National*
24 *Science Foundation to carry out activities described*

1 *in paragraph (1) through the Course, Curriculum,*
2 *and Laboratory Improvement program—*

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

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

9 *(3) ADVANCED TECHNOLOGY EDUCATION AU-*
10 *THORIZATION.—There are authorized to be appro-*
11 *priated to the Director of the National Science Foun-*
12 *dition to carry out activities described in paragraph*
13 *(1) through the Advanced Technology Education pro-*
14 *gram—*

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

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

21 *(e) INTERAGENCY WORKING GROUP.—The National*
22 *Science and Technology Council shall establish under the*
23 *Nanoscale Science, Engineering, and Technology Sub-*
24 *committee an Education Working Group to coordinate,*

1 *prioritize, and plan the educational activities supported*
2 *under the Program.*

3 (f) *SOCIETAL DIMENSIONS IN NANOTECHNOLOGY EDU-*
4 *CATION ACTIVITIES.—Activities supported under the Edu-*
5 *cation and Societal Dimensions program component area,*
6 *or any successor program component area, that involve in-*
7 *formal, precollege, or undergraduate nanotechnology edu-*
8 *cation shall include education regarding the environmental,*
9 *health and safety, and other societal aspects of*
10 *nanotechnology.*

11 (g) *REMOTE ACCESS TO NANOTECHNOLOGY FACILI-*
12 *TIES.—(1) Agencies supporting nanotechnology research fa-*
13 *cilities as part of the Program shall require the entities that*
14 *operate such facilities to allow access via the Internet, and*
15 *support the costs associated with the provision of such ac-*
16 *cess, by secondary school students and teachers, to instru-*
17 *ments and equipment within such facilities for educational*
18 *purposes. The agencies may waive this requirement for*
19 *cases when particular facilities would be inappropriate for*
20 *educational purposes or the costs for providing such access*
21 *would be prohibitive.*

22 (2) *The agencies identified in paragraph (1) shall re-*
23 *quire the entities that operate such nanotechnology research*
24 *facilities to establish and publish procedures, guidelines,*
25 *and conditions for the submission and approval of applica-*

1 *tions for the use of the facilities for the purpose identified*
2 *in paragraph (1) and shall authorize personnel who operate*
3 *the facilities to provide necessary technical support to stu-*
4 *dents and teachers.*

5 **SEC. 4. TECHNOLOGY TRANSFER.**

6 *(a) PROTOTYPING.—*

7 *(1) ACCESS TO FACILITIES.—In accordance with*
8 *section 2(b)(7) of 21st Century Nanotechnology Re-*
9 *search and Development Act (15 U.S.C. 7501(b)(7)),*
10 *the agencies supporting nanotechnology research fa-*
11 *cilities as part of the Program shall provide access to*
12 *such facilities to companies for the purpose of assist-*
13 *ing the companies in the development of prototypes of*
14 *nanoscale products, devices, or processes (or products,*
15 *devices, or processes enabled by nanotechnology) for*
16 *determining proof of concept. The agencies shall pub-*
17 *licize the availability of these facilities and encourage*
18 *their use by companies as provided for in this section.*

19 *(2) PROCEDURES.—The agencies identified in*
20 *paragraph (1)—*

21 *(A) shall establish and publish procedures,*
22 *guidelines, and conditions for the submission*
23 *and approval of applications for use of*
24 *nanotechnology facilities;*

1 (B) shall publish descriptions of the capa-
2 bilities of facilities available for use under this
3 subsection, including the availability of technical
4 support; and

5 (C) may waive recovery, require full recov-
6 ery, or require partial recovery of the costs asso-
7 ciated with use of the facilities for projects under
8 this subsection.

9 (3) *SELECTION AND CRITERIA.*—In cases when
10 less than full cost recovery is required pursuant to
11 paragraph (2)(C), projects provided access to
12 nanotechnology facilities in accordance with this sub-
13 section shall be selected through a competitive, merit-
14 based process, and the criteria for the selection of such
15 projects shall include at a minimum—

16 (A) the readiness of the project for tech-
17 nology demonstration;

18 (B) evidence of a commitment by the appli-
19 cant for further development of the project to full
20 commercialization if the proof of concept is es-
21 tablished by the prototype; and

22 (C) evidence of the potential for further
23 funding from private sector sources following the
24 successful demonstration of proof of concept.

1 *The agencies may give special consideration in select-*
2 *ing projects to applications that are relevant to im-*
3 *portant national needs or requirements.*

4 ***(b) USE OF EXISTING TECHNOLOGY TRANSFER PRO-***
5 ***GRAMS.—***

6 ***(1) PARTICIPATING AGENCIES.—****Each agency*
7 *participating in the Program shall—*

8 ***(A)*** *encourage the submission of applica-*
9 *tions for support of nanotechnology related*
10 *projects to the Small Business Innovation Re-*
11 *search Program and the Small Business Tech-*
12 *nology Transfer Program administered by such*
13 *agencies; and*

14 ***(B)*** *through the National Nanotechnology*
15 *Coordination Office and within 6 months after*
16 *the date of enactment of this Act, submit to the*
17 *Committee on Commerce, Science, and Transpor-*
18 *tation of the Senate and the Committee on*
19 *Science and Technology of the House of Rep-*
20 *resentatives—*

21 ***(i)*** *the plan described in section 2(c)(7)*
22 *of the 21st Century Nanotechnology Re-*
23 *search and Development Act (15 U.S.C.*
24 *7501(c)(7)); and*

1 (ii) a report specifying, if the agency
2 administers a Small Business Innovation
3 Research Program and a Small Business
4 Technology Transfer Program—

5 (I) the number of proposals re-
6 ceived for nanotechnology related
7 projects during the current fiscal year
8 and the previous 2 fiscal years;

9 (II) the number of such proposals
10 funded in each year;

11 (III) the total number of
12 nanotechnology related projects funded
13 and the amount of funding provided
14 for fiscal year 2003 through fiscal year
15 2007; and

16 (IV) a description of the projects
17 identified in accordance with subclause
18 (III) which received private sector
19 funding beyond the period of phase II
20 support.

21 (2) NATIONAL INSTITUTE OF STANDARDS AND
22 TECHNOLOGY.—The Director of the National Institute
23 of Standards and Technology in carrying out the re-
24 quirements of section 28 of the National Institute of

1 *Standards and Technology Act (15 U.S.C. 278n)*
2 *shall—*

3 *(A) in regard to subsection (d) of that sec-*
4 *tion, encourage the submission of proposals for*
5 *support of nanotechnology related projects; and*

6 *(B) in regard to subsection (g) of that sec-*
7 *tion, include a description of how the require-*
8 *ment of subparagraph (A) of this paragraph is*
9 *being met, the number of proposals for*
10 *nanotechnology related projects received, the*
11 *number of such proposals funded, the total num-*
12 *ber of such projects funded since the beginning of*
13 *the Technology Innovation Program, and the*
14 *outcomes of such funded projects in terms of the*
15 *metrics developed in accordance with such sub-*
16 *section (g).*

17 *(3) TIP ADVISORY BOARD.—The TIP Advisory*
18 *Board established under section 28(k) of the National*
19 *Institute of Standards and Technology Act (15 U.S.C.*
20 *278n(k)), in carrying out its responsibilities under*
21 *subsection (k)(3), shall provide the Director of the Na-*
22 *tional Institute of Standards and Technology with—*

23 *(A) advice on how to accomplish the re-*
24 *quirement of paragraph (2)(A) of this subsection;*
25 *and*

1 (B) an assessment of the adequacy of the al-
2 location of resources for nanotechnology related
3 projects supported under the Technology Innova-
4 tion Program.

5 (c) *INDUSTRY LIAISON GROUPS.*—An objective of the
6 Program shall be to establish industry liaison groups for
7 all industry sectors that would benefit from applications of
8 nanotechnology. The Nanomanufacturing, Industry Liai-
9 son, and Innovation Working Group of the National Science
10 and Technology Council shall actively pursue establishing
11 such liaison groups.

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

16 “(5) ensuring United States global leadership in
17 the development and application of nanotechnology,
18 including through coordination and leveraging Fed-
19 eral investments with nanotechnology research, devel-
20 opment, and technology transition initiatives sup-
21 ported by the States;”.

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

23 (a) *IN GENERAL.*—The Program shall include support
24 for nanotechnology research and development activities di-
25 rected toward application areas that have the potential for

1 *significant contributions to national economic competitive-*
2 *ness and for other significant societal benefits. The activities*
3 *supported shall be designed to advance the development of*
4 *research discoveries by demonstrating technical solutions to*
5 *important problems in such areas as nano-electronics, en-*
6 *ergy efficiency, health care, and water remediation and pu-*
7 *rification. The Advisory Panel shall make recommendations*
8 *to the Program for candidate research and development*
9 *areas for support under this section.*

10 *(b) CHARACTERISTICS.—*

11 *(1) IN GENERAL.—Research and development ac-*
12 *tivities under this section shall—*

13 *(A) include projects selected on the basis of*
14 *applications for support through a competitive,*
15 *merit-based process;*

16 *(B) involve collaborations among research-*
17 *ers in academic institutions and industry, and*
18 *may involve nonprofit research institutions and*
19 *Federal laboratories, as appropriate;*

20 *(C) when possible, leverage Federal invest-*
21 *ments through collaboration with related State*
22 *initiatives; and*

23 *(D) include a plan for fostering the transfer*
24 *of research discoveries and the results of tech-*

1 *nology demonstration activities to industry for*
2 *commercial development.*

3 (2) *PROCEDURES.—Determination of the re-*
4 *quirements for applications under this subsection, re-*
5 *view and selection of applications for support, and*
6 *subsequent funding of projects shall be carried out by*
7 *a collaboration of no fewer than 2 agencies partici-*
8 *pating in the Program. In selecting applications for*
9 *support, the agencies shall give special consideration*
10 *to projects that include cost sharing from non-Federal*
11 *sources.*

12 (3) *INTERDISCIPLINARY RESEARCH CENTERS.—*
13 *Research and development activities under this sec-*
14 *tion may be supported through interdisciplinary*
15 *nanotechnology research centers, as authorized by sec-*
16 *tion 2(b)(4) of the 21st Century Nanotechnology Re-*
17 *search and Development Act (15 U.S.C. 7501(b)(4)),*
18 *that are organized to investigate basic research ques-*
19 *tions and carry out technology demonstration activi-*
20 *ties in areas such as those identified in subsection (a).*

21 (c) *REPORT.—Reports required under section 2(d) of*
22 *the 21st Century Nanotechnology Research and Develop-*
23 *ment Act (15 U.S.C. 7501(d)) shall include a description*
24 *of research and development areas supported in accordance*
25 *with this section, including the same budget information*

1 *as is required for program component areas under para-*
2 *graphs (1) and (2) of such section 2(d).*

3 **SEC. 6. NANOMANUFACTURING RESEARCH.**

4 *(a) RESEARCH AREAS.—The Nanomanufacturing pro-*
5 *gram component area, or any successor program component*
6 *area, shall include research on—*

7 *(1) development of instrumentation and tools re-*
8 *quired for the rapid characterization of nanoscale*
9 *materials and for monitoring of nanoscale manufac-*
10 *turing processes; and*

11 *(2) approaches and techniques for scaling the*
12 *synthesis of new nanoscale materials to achieve indus-*
13 *trial-level production rates.*

14 *(b) GREEN NANOTECHNOLOGY.—Interdisciplinary re-*
15 *search centers supported under the Program in accordance*
16 *with section 2(b)(4) of the 21st Century Nanotechnology Re-*
17 *search and Development Act (15 U.S.C. 7501(b)(4)) that*
18 *are focused on nanomanufacturing research and centers es-*
19 *tablished under the authority of section 5(b)(3) of this Act*
20 *shall include as part of the activities of such centers—*

21 *(1) research on methods and approaches to de-*
22 *velop environmentally benign nanoscale products and*
23 *nanoscale manufacturing processes, taking into con-*
24 *sideration relevant findings and results of research*
25 *supported under the Environmental, Health, and*

1 *Safety program component area, or any successor*
2 *program component area;*

3 (2) *fostering the transfer of the results of such re-*
4 *search to industry; and*

5 (3) *providing for the education of scientists and*
6 *engineers through interdisciplinary studies in the*
7 *principles and techniques for the design and develop-*
8 *ment of environmentally benign nanoscale products*
9 *and processes.*

10 (c) *REVIEW OF NANOMANUFACTURING RESEARCH AND*
11 *RESEARCH FACILITIES.—*

12 (1) *PUBLIC MEETING.—Not later than 12 months*
13 *after the date of enactment of this Act, the National*
14 *Nanotechnology Coordination Office shall sponsor a*
15 *public meeting, including representation from a wide*
16 *range of industries engaged in nanoscale manufac-*
17 *turing, to—*

18 (A) *obtain the views of participants at the*
19 *meeting on—*

20 (i) *the relevance and value of the re-*
21 *search being carried out under the*
22 *Nanomanufacturing program component*
23 *area of the Program, or any successor pro-*
24 *gram component area; and*

1 (ii) whether the capabilities of
2 nanotechnology research facilities supported
3 under the Program are adequate—

4 (I) to meet current and near-term
5 requirements for the fabrication and
6 characterization of nanoscale devices
7 and systems; and

8 (II) to provide access to and use
9 of instrumentation and equipment at
10 the facilities, by means of networking
11 technology, to individuals who are at
12 locations remote from the facilities;
13 and

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

21 Companies participating in industry liaison groups
22 shall be invited to participate in the meeting. The Co-
23 ordination Office shall prepare a report documenting
24 the findings and recommendations resulting from the
25 meeting.

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

7 (A) *whether the funding for the Nanomanu-*
8 *facturing program component area, or any suc-*
9 *cessor program component area, is adequate and*
10 *receiving appropriate priority within the overall*
11 *resources available for the Program;*

12 (B) *the relevance of the research being sup-*
13 *ported to the identified needs and requirements*
14 *of industry;*

15 (C) *whether the capabilities of nanotechnol-*
16 *ogy research facilities supported under the Pro-*
17 *gram are adequate—*

18 (i) *to meet current and near-term re-*
19 *quirements for the fabrication and charac-*
20 *terization of nanoscale devices and systems;*
21 *and*

22 (ii) *to provide access to and use of in-*
23 *strumentation and equipment at the facili-*
24 *ties, by means of networking technology, to*

1 *individuals who are at locations remote*
2 *from the facilities; and*

3 *(D) the level of funding that would be need-*
4 *ed to support—*

5 *(i) the acquisition of instrumentation,*
6 *equipment, and networking technology suffi-*
7 *cient to provide the capabilities at*
8 *nanotechnology research facilities described*
9 *in subparagraph (C); and*

10 *(ii) the operation and maintenance of*
11 *such facilities.*

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

16 *(3) REPORT.—Not later than 18 months after the*
17 *date of enactment of this Act, the Advisory Panel*
18 *shall submit to the Committee on Commerce, Science,*
19 *and Transportation of the Senate and the Committee*
20 *on Science and Technology of the House of Represent-*
21 *atives a report on its assessment required under para-*
22 *graph (2), along with any recommendations and a*
23 *copy of the report prepared in accordance with para-*
24 *graph (1).*

1 **SEC. 7. DEFINITIONS.**

2 *In this Act, terms that are defined in section 10 of*
3 *the 21st Century Nanotechnology Research and Develop-*
4 *ment Act (15 U.S.C. 7509) have the meaning given those*
5 *terms in that section.*

Union Calendar No. 427

110TH CONGRESS
2^D SESSION

H. R. 5940

[Report No. 110-682]

A BILL

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

JUNE 4, 2008

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed