

109TH CONGRESS
2^D SESSION

S. 2802

To improve American innovation and competitiveness in the global economy.

IN THE SENATE OF THE UNITED STATES

MAY 15, 2006

Mr. ENSIGN (for himself, Mr. STEVENS, and Mrs. HUTCHISON) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

A BILL

To improve American innovation and competitiveness in the global economy.

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; TABLE OF CONTENTS.**

4 (a) **SHORT TITLE.**—This Act may be cited as the
5 “American Innovation and Competitiveness Act of 2006”.

6 (b) **TABLE OF CONTENTS.**—The table of contents for
7 this Act is as follows:

Sec. 1. Short title; table of contents.

**TITLE I—OFFICE OF SCIENCE AND TECHNOLOGY POLICY;
GOVERNMENT-WIDE SCIENCE**

Sec. 101. National science and technology summit.

Sec. 102. Study on barriers to innovation.

Sec. 103. National innovation medal.

TITLE II—INNOVATION PROMOTION

Sec. 201. President’s Council on Innovation and Competitiveness.

Sec. 202. Innovation acceleration grants.

Sec. 203. Regional economic development.

TITLE III—NATIONAL SCIENCE FOUNDATION

Sec. 301. Authorization of appropriations.

Sec. 302. Innovation-based experiential learning.

Sec. 303. Graduate fellowships and graduate traineeships.

Sec. 304. Professional science masters degree programs.

Sec. 305. Increased support for science education through the National Science Foundation.

Sec. 306. Study of service science.

Sec. 307. Meeting critical national science needs.

Sec. 308. Experimental program to stimulate competitive research.

TITLE IV—NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Sec. 401. NASA’s contribution to innovation.

Sec. 402. Aeronautics Institute for Research.

Sec. 403. Basic research enhancement.

TITLE V—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Sec. 501. Authorization of appropriations.

Sec. 502. Amendments to the Stevenson-Wydler Technology Innovation Act of 1980.

Sec. 503. Innovation acceleration.

Sec. 504. Development of advanced manufacturing systems.

Sec. 505. Collaborative manufacturing research pilot grants.

Sec. 506. Manufacturing extension.

Sec. 507. Experimental program to stimulate competitive technology.

Sec. 508. Technical amendments to the National Institute of Standards and Technology Act and other technical amendments.

1 **TITLE I—OFFICE OF SCIENCE**
2 **AND TECHNOLOGY POLICY;**
3 **GOVERNMENT-WIDE SCIENCE**

4 **SEC. 101. NATIONAL SCIENCE AND TECHNOLOGY SUMMIT.**

5 (a) IN GENERAL.—Within 180 days after the date
6 of enactment of this act, the President shall convene a
7 National Science and Technology Summit. The Summit
8 shall include representatives of industry, small business,

1 academia, State government, and Federal research and
2 development agencies. The summit shall examine the
3 health and direction of the United States' science and
4 technology enterprise.

5 (b) REPORT.—Within 90 days after the end of the
6 Summit, the President shall issue a report on the results
7 of the Summit. The report shall identify key research and
8 technology challenges and recommendations for areas of
9 investment for Federal research and technology programs
10 over the next 5 years beginning after the report is issued.

11 (c) ANNUAL EVALUATION.—Beginning with the first
12 year ending after the date of enactment of this Act, the
13 Director of the Office of Science and Technology Policy
14 shall publish an annual report containing recommenda-
15 tions for areas of investment for Federal research and
16 technology programs, together with a justification for each
17 area identified in the report. For the first 5 years after
18 the Summit, the report shall take into account rec-
19 ommendations of the Summit.

20 **SEC. 102. STUDY ON BARRIERS TO INNOVATION.**

21 (a) IN GENERAL.—The National Academy of
22 Sciences shall conduct and complete a study to identify,
23 and to review methods to mitigate, new forms of risk for
24 businesses beyond conventional operational and financial

1 risk that affect the ability to innovate, including studying
2 and reviewing—

3 (1) incentive and compensation structures that
4 could effectively encourage long-term value creation
5 and innovation;

6 (2) methods of voluntary and supplemental dis-
7 closure by industry of intellectual capital, innovation
8 performance, and indicators of future valuation;

9 (3) means by which government could work
10 with industry to enhance the legal and regulatory
11 framework to encourage the disclosures described in
12 paragraph (2);

13 (4) practices that may be significant deterrents
14 to United States businesses engaging in innovation
15 risk-taking compared to foreign competitors, includ-
16 ing tort litigation, the nature and extent of any re-
17 sulting defensive management practices, and rec-
18 ommendations on practices to restore innovation
19 risk-taking and to overcome defensive practices;

20 (5) means by which industry, trade associa-
21 tions, and universities could collaborate to support
22 research on management practices and methodolo-
23 gies for assessing the value and risks of longer term
24 innovation strategies; and

1 (6) means to encourage new, open, and collabo-
2 rative dialogue between industry associations, regu-
3 latory authorities, management, shareholders, and
4 other concerned interests to encourage appropriate
5 approaches to innovation risk-taking.

6 (b) REPORT REQUIRED.—The National Academy of
7 Sciences shall, not later than 1 year after the date of en-
8 actment of this Act and every 4 years thereafter, submit
9 to Congress a report on the study conducted under sub-
10 section (a).

11 (c) AUTHORIZATION OF APPROPRIATIONS.—There
12 are authorized to be appropriated to the National Acad-
13 emy of Sciences \$1,000,000 for fiscal year 2007 for the
14 purpose of carrying out the study required under this sec-
15 tion.

16 **SEC. 103. NATIONAL INNOVATION MEDAL.**

17 Section 16 of the Stevenson-Wydler Technology Inno-
18 vation Act of 1980 (15 U.S.C. 3711) is amended—

19 (1) by striking the section heading and insert-
20 ing “**SEC. 16. NATIONAL TECHNOLOGY**
21 **MEDAL; NATIONAL INNOVATION**
22 **MEDAL.**”;

23 (2) by striking “is” in subsection (a) and in-
24 serting “are”;

1 (3) by striking “Medal,” in subsection (a) and
2 inserting “Medal and a National Innovation Medal”;

3 (4) by striking “medal,” in subsection (b) and
4 inserting “medals,”;

5 (5) by striking “States.” in subsection (b) and
6 inserting “States or by reason of their unique sci-
7 entific and engineering innovations in the National
8 interest at the time such innovation occurs.”; and

9 (6) by striking “presentation of the award” in
10 subsection (c) and inserting “presentations of the
11 awards”.

12 **TITLE II—INNOVATION** 13 **PROMOTION**

14 **SEC. 201. PRESIDENT’S COUNCIL ON INNOVATION AND** 15 **COMPETITIVENESS.**

16 (a) **IN GENERAL.**—The President shall establish a
17 President’s Council on Innovation and Competitiveness.

18 (b) **DUTIES.**—The Council’s duties shall include—

19 (1) monitoring implementation of public laws
20 and initiatives for promoting innovation, including
21 policies related to research funding, taxation, immi-
22 gration, trade, and education that are proposed in
23 this and other Acts;

24 (2) in consultation with the Director of the Of-
25 fice of Management and Budget, developing a proc-

1 ess for using metrics to assess the impact of existing
2 and proposed policies and rules that affect innova-
3 tion capabilities in the United States;

4 (3) identifying opportunities and making rec-
5 ommendations for the heads of executive agencies to
6 improve innovation, monitoring, and reporting on
7 the implementation of such recommendations;

8 (4) developing metrics for measuring the
9 progress of the Federal Government with respect to
10 improving conditions for innovation, including
11 through talent development, investment, and infra-
12 structure improvements; and

13 (5) submitting an annual report to the Presi-
14 dent and Congress on such progress.

15 (c) MEMBERSHIP AND COORDINATION.—

16 (1) MEMBERSHIP.—The Council shall be com-
17 posed of the Secretary or head of each of the fol-
18 lowing:

19 (A) The Department of Commerce.

20 (B) The Department of Defense.

21 (C) The Department of Education.

22 (D) The Department of Energy.

23 (E) The Department of Health and
24 Human Services.

1 (F) The Department of Homeland Secu-
2 rity.

3 (G) The Department of Labor.

4 (H) The Department of the Treasury.

5 (I) The National Aeronautics and Space
6 Administration.

7 (J) The Securities and Exchange Commis-
8 sion.

9 (K) The National Science Foundation.

10 (L) The Office of the United States Trade
11 Representative.

12 (M) The Office of Management and Budg-
13 et.

14 (N) The Office of Science and Technology
15 Policy.

16 (O) Any other department or agency des-
17 igned by the President.

18 (2) CHAIRPERSON.—The Secretary of Com-
19 merce shall serve as chairperson of the Council.

20 (3) COORDINATION.—The chairperson of the
21 Council shall ensure appropriate coordination be-
22 tween the Council and the National Economic Coun-
23 cil, the National Security Council, and the National
24 Science and Technology Council.

25 (d) DEVELOPMENT OF INNOVATION AGENDA.—

1 (1) IN GENERAL.—The Council shall develop a
2 comprehensive agenda for strengthening the innova-
3 tion and competitiveness capabilities of the Federal
4 Government and State governments, academia, and
5 the private sector in the United States.

6 (2) CONSULTATION.—The comprehensive agen-
7 da required by paragraph (1) shall be developed in
8 consultation with appropriate representatives of the
9 private sector, scientific organizations, and academic
10 organizations.

11 (e) TECHNICAL AMENDMENT.—Section 101(b) of the
12 High-Performance Computing Act of 1991 (15 U.S.C.
13 5511(b)) is amended by striking “an” in the first sentence
14 and inserting “a distinct”.

15 **SEC. 202. INNOVATION ACCELERATION GRANTS.**

16 (a) GRANT PROGRAM.—The President, through the
17 head of each Federal research agency, shall establish a
18 grant program, to be known as the “Innovation Accelera-
19 tion Grants Program”, to support and promote innovation
20 in the United States. Priority in the awarding of grants
21 shall be given to projects that—

22 (1) meet fundamental technology challenges;

23 (2) involve multidisciplinary work and a high
24 degree of novelty;

1 (3) have the potential for yielding results with
2 far-ranging or wide-ranging implications but are
3 considered too novel or span too diverse a range of
4 disciplines to fare well in the traditional peer review
5 process.

6 (b) AWARDING OF GRANTS THROUGH DEPARTMENTS
7 AND AGENCIES.—

8 (1) FUNDING GOALS.—The President shall en-
9 sure that it is the goal of each Executive agency (as
10 defined in section 105 of title 5, United States
11 Code) that finances research in science, mathe-
12 matics, engineering, and technology to allocate ap-
13 proximately 8 percent of the agency’s total annual
14 research and development budget to funding grants
15 under the Innovation Acceleration Grants Program.

16 (2) ADMINISTRATION.—

17 (A) IN GENERAL.—Each head of an Exec-
18 utive agency awarding grants under paragraph
19 (1) shall submit a plan for implementing the
20 grant program within such Executive agency to
21 the Director of the Office of Science and Tech-
22 nology Policy and the Director of the Office of
23 Management and Budget. The implementation
24 plan shall be submitted not later than 90 days
25 after the date of enactment of this Act. The im-

1 plementation plan may incorporate existing ini-
2 tiatives of the Executive agencies that promote
3 research in innovation as described in sub-
4 section (a).

5 (B) REQUIRED METRICS.—The head of
6 each Executive agency submitting an implemen-
7 tation plan pursuant to this section shall in-
8 clude metrics upon which grant funding deci-
9 sions will be made and metrics for assessing the
10 success of the grants awarded.

11 (C) GRANT DURATION AND RENEWALS.—

12 (i) IN GENERAL.—Any grants issued
13 by an Executive agency under this section
14 shall be for a period not to exceed 3 years.

15 (ii) EVALUATION.—Not later than 90
16 days prior to the expiration of a grant
17 issued under this section, the Executive
18 agency that approved the grant shall com-
19 plete an evaluation of the effectiveness of
20 the grant based on the metrics established
21 pursuant to subparagraph (B). In its eval-
22 uation, the Executive agency shall consider
23 the extent to which the program funded by
24 the grant met the goals of quality improve-
25 ment and job creation.

1 (iii) PUBLICATION OF REVIEW.—The
2 Executive agency shall publish and make
3 available to the public the review of each
4 grant approved pursuant to this section.

5 (iv) FAILURE TO MEET METRICS.—
6 Any grant that the Executive agency
7 awarding the grant determines has failed
8 to satisfy any of the metrics developed pur-
9 suant to subparagraph (B), shall not be el-
10 igible for a renewal.

11 (v) RENEWAL.—A grant issued under
12 this section that satisfies all of the metrics
13 developed pursuant to subparagraph (B),
14 may be renewed once for a period not to
15 exceed 3 years. Additional renewals may be
16 considered only if the head of the Execu-
17 tive agency makes a specific finding that
18 the program being funded involves a sig-
19 nificant technology advance that requires a
20 longer timeframe to complete critical re-
21 search, and the research satisfies all the
22 metrics developed pursuant to subpara-
23 graph (B).

24 (c) DEFINITIONS.—

1 (1) FEDERAL RESEARCH AGENCY DEFINED.—

2 In this section, the term “Federal research agency”
3 means a major organizational component of a de-
4 partment or agency of the Federal Government, or
5 other establishment of the Federal Government op-
6 erating with appropriated funds, that has as its pri-
7 mary purpose the performance of scientific research.

8 (2) MAJOR ORGANIZATIONAL COMPONENT.—

9 The term “major organizational component”, with
10 respect to a department, agency, or other establish-
11 ment of the Federal Government, means a compo-
12 nent of the department, agency, or other establish-
13 ment that is administered by an individual whose
14 rate of basic pay is not less than the rate of basic
15 pay payable under level V of the Executive Schedule
16 under section 5316 of title 5, United States Code.

17 **SEC. 203. REGIONAL ECONOMIC DEVELOPMENT.**

18 (a) DEVELOPMENT OF FUNDING STRATEGY.—

19 (1) IN GENERAL.—The Assistant Secretary for
20 Economic Development of the Department of Com-
21 merce shall review Federal programs that support
22 local economic development and prepare and imple-
23 ment a strategy to focus greater funding on initia-
24 tives that improve the ability of communities to par-
25 ticipate successfully in the modern economy through

1 innovation. In preparing the strategy, priority should
2 be given to projects that—

3 (A) emphasize private sector cooperation
4 with State and local governments and nonprofit
5 organizations focused on regional economic de-
6 velopment as the means of achieving specific
7 objectives related to the support and promotion
8 of innovation; and

9 (B) are the most successful in meeting the
10 metrics established under subsection (b).

11 (2) COORDINATION.—The Assistant Secretary
12 shall coordinate the development and implementation
13 of the strategy with the activities carried out by the
14 Secretary of Commerce under subsection (d).

15 (b) EVALUATION OF PROGRAMS.—The Assistant Sec-
16 retary for Economic Development of the Department of
17 Commerce shall develop metrics to measure the success
18 of Federal programs in supporting and promoting innova-
19 tion at the local community level while minimizing bu-
20 reaucracy and overhead expenses.

21 (c) PROMOTION OF ECONOMIC DEVELOPMENT OP-
22 PORTUNITIES.—The Assistant Secretary for Economic
23 Development of the Department of Commerce should work
24 with organizations focused on economic development to
25 highlight opportunities for such organizations to serve

1 local communities through grants focused on economic de-
2 velopment and investment in companies pursuing innova-
3 tion.

4 (d) REGIONAL INNOVATION HOT SPOTS.—

5 (1) PROMOTION OF REGIONAL INNOVATION HOT
6 SPOTS.—The Secretary of Commerce shall coordi-
7 nate activities focused on promoting innovation
8 through the development of regional innovation hot
9 spots.

10 (2) GUIDE TO DEVELOPING SUCCESSFUL RE-
11 GIONAL INNOVATION HOT SPOTS.—

12 (A) IN GENERAL.—Not later than 1 year
13 after the date of enactment of this Act, the Sec-
14 retary of Commerce, in consultation with rep-
15 resentatives of regional innovation hot spots,
16 shall publish a report, to be titled the “Guide
17 to Developing Successful Regional Innovation
18 Hot Spots”, that examines successful regional
19 innovation hot spots and includes recommenda-
20 tions for establishing and fostering regional in-
21 novation hot spots.

22 (B) CONTENT.—The report required under
23 subparagraph (A) shall—

24 (i) include information on the evalua-
25 tion of human capital;

1 (ii) include information on the role of
2 sponsoring institutions, such as univer-
3 sities, nonprofit organizations, and labora-
4 tories, in establishing and fostering re-
5 gional innovation hot spots;

6 (iii) include information on the role of
7 State and local government leaders, leaders
8 in the research and business communities,
9 and community organizations in estab-
10 lishing and fostering regional innovation
11 hot spots;

12 (iv) discuss the importance of collabo-
13 ration by public and private sector leaders;

14 (v) identify sources of funding for
15 these activities within Federal, State, and
16 local governments and the private sector;
17 and

18 (vi) include recommendations for de-
19 veloping strategic plans to stimulate inno-
20 vation, including recommendations relating
21 to knowledge transfer and commercializa-
22 tion, the support of regional entrepreneur-
23 ship and increased innovation within exist-
24 ing regional firms, and the linking of pri-

1 mary institutions engaged in the innova-
2 tion process.

3 (3) REGIONAL INNOVATION HOT SPOT
4 METRICS.—

5 (A) DEVELOPMENT OF METRICS.—In con-
6 junction with publishing the report required
7 under paragraph (2), the Secretary of Com-
8 merce shall develop the following sets of
9 metrics:

10 (i) Metrics to be considered for identi-
11 fying potential regional innovation hot
12 spots (in this subsection referred to as
13 “identifying metrics”).

14 (ii) Metrics to be considered for evalu-
15 ating the impact and effectiveness of estab-
16 lished regional innovation hot spots (in this
17 subsection referred to as “evaluation
18 metrics”).

19 (B) USE OF METRICS.—The Secretary of
20 Commerce shall use the identifying metrics to
21 conduct biannual assessments of potential re-
22 gional clusters and shall use the evaluation
23 metrics to assess the impact and effectiveness
24 of established regional innovation hot spots in
25 improving the regional economy and regional

1 job market. The Secretary shall also assess the
 2 cost effectiveness of operating within each re-
 3 gional hot spot. The Secretary shall report the
 4 biannual assessments to Congress.

5 (e) REGIONAL INNOVATION HOT SPOTS.—In this
 6 section, the term “regional innovation hot spots” means
 7 regions that are defined by a high degree of innovation
 8 and the availability of talent, investment, and infrastruc-
 9 ture necessary to create and sustain such innovation.

10 **TITLE III—NATIONAL SCIENCE** 11 **FOUNDATION**

12 **SEC. 301. AUTHORIZATION OF APPROPRIATIONS.**

13 (a) IN GENERAL.—There are authorized to be appro-
 14 priated to the National Science Foundation—

- 15 (1) \$6,440,000,000 for fiscal year 2007;
- 16 (2) \$7,433,000,000 for fiscal year 2008;
- 17 (3) \$8,577,000,000 for fiscal year 2009;
- 18 (4) \$9,898,000,000 for fiscal year 2010; and
- 19 (5) \$11,422,000,000 for fiscal year 2011.

20 (b) PLAN FOR INCREASED RESEARCH.—

21 (1) IN GENERAL.—Not later than 180 days
 22 after the date of the enactment of this Act, the Di-
 23 rector of the National Science Foundation shall sub-
 24 mit a comprehensive, multiyear plan that describes
 25 how the funds authorized in subsection (a) would be

1 used, if appropriated, to the Senate Committee on
2 Commerce, Science, and Transportation, the Senate
3 Committee on Health, Education, Labor, and Pen-
4 sions and the House of Representatives Committee
5 on Science.

6 (2) PLAN REQUIREMENTS.—The Director
7 shall—

8 (A) develop the plan with a focus on
9 strengthening the Nation’s lead in physical
10 science and technology, increasing overall work-
11 force skills in physical science, technology, engi-
12 neering, and mathematics at all levels, and
13 strengthening innovation by expanding the
14 focus of competitiveness and innovation policy
15 at the regional and local level; and

16 (B) emphasize spending increased research
17 funds appropriated pursuant to subsection (a)
18 in areas of investment for Federal research and
19 technology programs identified under section
20 101(c) of this Act.

21 **SEC. 302. INNOVATION-BASED EXPERIENTIAL LEARNING.**

22 (a) IN GENERAL.—The Director of the National
23 Science Foundation shall establish a grant program under
24 which grants are provided to local educational agencies to
25 enable the local educational agencies to implement innova-

1 tion-based experiential learning in a total of up to 500
 2 secondary schools and up to 500 elementary or middle
 3 schools in the United States.

4 (b) APPLICATIONS.—A local educational agency de-
 5 siring a grant under this section shall submit an applica-
 6 tion at such time, in such manner, and accompanied by
 7 such information as the Director of the National Science
 8 Foundation may require.

9 (c) EXPERIENTIAL LEARNING DEFINED.—In this
 10 section, the term “experiential learning” means a teaching
 11 model that—

12 (1) begins with a relevant, real-world problem;

13 (2) requires a student to research and plan a
 14 solution to the problem, and experiment with that
 15 solution; and

16 (3) follows the experiment with analysis, reflec-
 17 tion, discussion, and a redesign of the solution.

18 **SEC. 303. GRADUATE FELLOWSHIPS AND GRADUATE**
 19 **TRAINEESHIPS.**

20 (a) GRADUATE RESEARCH FELLOWSHIP PRO-
 21 GRAM.—

22 (1) IN GENERAL.—During the 5-year period be-
 23 ginning on the date of the enactment of this Act, the
 24 Director of the National Science Foundation shall
 25 expand the Graduate Research Fellowship Program

1 of the Foundation so that an additional 1,250 fel-
2 lowships are awarded to United States citizens
3 under the Program during that period.

4 (2) EXTENSION OF FELLOWSHIP PERIOD.—The
5 Director is authorized to award fellowships under
6 the Graduate Research Fellowship Program for a
7 period of up to 5 years.

8 (3) AUTHORIZATION OF APPROPRIATIONS.—
9 Within the amounts authorized to be appropriated
10 by section 301, there are authorized to be appro-
11 priated \$34,000,000 for each of the fiscal years
12 2007 through 2011 to provide an additional 250 fel-
13 lowships under the Graduate Research Fellowship
14 Program during each such fiscal year.

15 (b) INTEGRATIVE GRADUATE EDUCATION AND RE-
16 SEARCH TRAINEESHIP PROGRAM.—

17 (1) IN GENERAL.—During the 5-year period be-
18 ginning on the date of the enactment of this Act, the
19 Director shall expand the Integrative Graduate Edu-
20 cation and Research Traineeship program of the
21 Foundation so that an additional 1,250 United
22 States citizens are awarded grants under the pro-
23 gram during that period.

24 (2) AUTHORIZATION OF APPROPRIATIONS.—
25 Within the amounts authorized to be appropriated

1 by section 301, there are authorized to be appro-
2 priated \$57,000,000 for each of the fiscal years
3 2007 through 2011 to provide grants to an addi-
4 tional 250 individuals under the Integrative Grad-
5 uate Education and Research Traineeship program
6 during each such fiscal year.

7 **SEC. 304. PROFESSIONAL SCIENCE MASTERS DEGREE PRO-**
8 **GRAMS.**

9 (a) CLEARINGHOUSE.—

10 (1) DEVELOPMENT.—The Director of the Na-
11 tional Science Foundation shall establish a clearing-
12 house, in collaboration with 4-year institutions of
13 higher education, including applicable graduate
14 schools and academic departments, industries, and
15 Federal agencies that employ science-trained per-
16 sonnel, to share program elements used in successful
17 professional science masters degree programs.

18 (2) AVAILABILITY.—The Director shall make
19 the clearinghouse of program elements developed
20 under paragraph (1) available to institutions of
21 higher education that are developing professional
22 science masters degree programs.

23 (b) PILOT PROGRAMS.—

24 (1) PROGRAM AUTHORIZED.—The Director
25 shall award grants for pilot programs to 4-year in-

1 institutions of higher education to facilitate the insti-
2 tutions' creation or improvement of professional
3 science master's degree programs.

4 (2) APPLICATION.—A 4-year institution of
5 higher education desiring a grant under this section
6 shall submit an application at such time, in such
7 manner, and accompanied by such information as
8 the Director may require. The application shall in-
9 clude—

10 (A) a description of the professional
11 science masters degree program that the insti-
12 tution of higher education will implement;

13 (B) the amount of funding from non-Fed-
14 eral sources, including from private industries,
15 that the institution of higher education shall
16 use to support the professional masters degree
17 program; and

18 (C) an assurance that the institution of
19 higher education shall encourage students in
20 the professional science master's degree pro-
21 gram to apply for all forms of Federal assist-
22 ance available to such students, including appli-
23 cable graduate fellowships and student financial
24 assistance under title IV of the Higher Edu-
25 cation Act of 1965 (20 U.S.C. 1070 et seq.).

1 (3) PREFERENCE FOR ALTERNATIVE FUNDING
2 SOURCES.—The Director shall give preference in
3 making awards to 4-year institutions of higher edu-
4 cation seeking Federal funding to support pilot pro-
5 fessional science master’s degree programs, to those
6 applicants that secure more than $\frac{2}{3}$ of the funding
7 for such professional science masters degree pro-
8 grams from sources other than the Federal Govern-
9 ment.

10 (4) NUMBER OF GRANTS; TIME PERIOD OF
11 GRANTS.—

12 (A) NUMBER OF GRANTS.—Subject to the
13 availability of appropriated funds, the Director
14 shall award grants under paragraph (1) to a
15 maximum of 200 4-year institutions of higher
16 education.

17 (B) TIME PERIOD OF GRANTS.—Grants
18 awarded under this section shall be for one 3-
19 year term. Grants may be renewed only once
20 for a maximum of 2 additional years.

21 (5) EVALUATION AND REPORTS.—

22 (A) DEVELOPMENT OF PERFORMANCE
23 BENCHMARKS.—Prior to the start of the grant
24 program, the National Science Foundation, in
25 collaboration with 4-year institutions of higher

1 education, shall develop performance bench-
2 marks to evaluate the pilot programs assisted
3 by grants under this section.

4 (B) EVALUATION.—For each year of the
5 grant period, the Director, in consultation with
6 4-year institutions of higher education, and
7 Federal agencies that employ science-trained
8 personnel, shall complete an evaluation of each
9 pilot program assisted by grants under this sec-
10 tion. Any pilot program that fails to satisfy the
11 performance benchmarks developed under sub-
12 paragraph (A) shall not be eligible for further
13 funding.

14 (C) REPORT.—Not later than 180 days
15 after the completion of an evaluation described
16 in subparagraph (A), the Director, in consulta-
17 tion with industries and Federal agencies that
18 employ science-trained personnel, shall submit a
19 report to Congress that includes—

20 (i) the results of the evaluation de-
21 scribed in subparagraph (A); and

22 (ii) recommendations for administra-
23 tive and legislative action that could opti-
24 mize the effectiveness of the pilot pro-

1 grams, as the Director determines to be
2 appropriate.

3 (c) INSTITUTION OF HIGHER EDUCATION DE-
4 FINED.—In this section, the term “institution of higher
5 education” has the meaning given that term in section
6 101(a) of the Higher Education Act of 1965.

7 (d) AUTHORIZATION OF APPROPRIATIONS.—Within
8 the amounts authorized by be appropriate by section 301,
9 there are authorized to be appropriated to carry out this
10 section \$20,000,000 for fiscal year 2007 and such sums
11 as may be necessary for each succeeding fiscal year.

12 **SEC. 305. INCREASED SUPPORT FOR SCIENCE EDUCATION**
13 **THROUGH THE NATIONAL SCIENCE FOUNDA-**
14 **TION.**

15 Within the amounts authorized to be appropriated by
16 section 301, there are authorized to be appropriated to
17 carry out the physical science, mathematics, engineering,
18 and technology talent expansion program under section
19 8(7) of the National Science Foundation Authorization
20 Act of 2002 (Public Law 107–368, 116 Stat. 3042)—

- 21 (1) \$35,000,000 for fiscal year 2007;
22 (2) \$50,000,000 for fiscal year 2008;
23 (3) \$60,000,000 for fiscal year 2009; and
24 (4) \$70,000,000 for fiscal year 2010.

1 **SEC. 306. STUDY OF SERVICE SCIENCE.**

2 (a) SENSE OF CONGRESS.—It is the sense of Con-
3 gress that, in order to strengthen the competitiveness of
4 United States enterprises and institutions and to prepare
5 the people of the United States for high-wage, high-skill
6 employment, the Federal Government should better under-
7 stand and respond strategically to the emerging vocation
8 and learning discipline known as service science.

9 (b) STUDY.—Not later than 270 days after the date
10 of the enactment of this Act, the Director of the National
11 Science Foundation, through the National Academy of
12 Sciences, shall conduct a study and report to Congress re-
13 garding how the Federal Government should support,
14 through research, education, and training, the new dis-
15 cipline of service science.

16 (c) OUTSIDE RESOURCES.—In conducting the study
17 under subsection (b), the Director of the National Science
18 Foundation shall consult with leaders from 2- and 4-year
19 institutions of higher education, as defined in section 101
20 of the Higher Education Act of 1965 (20 U.S.C. 1001),
21 leaders from corporations, and other relevant parties.

22 (d) SERVICE SCIENCE DEFINED.—In this section:

23 (1) IN GENERAL.—The term “service science”
24 means curricula, research programs, and training
25 regimens, including service sciences, management,
26 and engineering programs, to teach individuals to

1 apply technology, organizational process manage-
 2 ment, and industry-specific knowledge to solve com-
 3 plex problems.

4 (2) SERVICE SCIENCES, MANAGEMENT, AND EN-
 5 GINEERING PROGRAMS.—The term “service sciences,
 6 management, and engineering programs” means the
 7 discipline known as service sciences, management,
 8 and engineering that—

9 (A) applies scientific, engineering, and
 10 management disciplines to tasks that one orga-
 11 nization performs beneficially for others, gen-
 12 erally as part of the services sector of the econ-
 13 omy; and

14 (B) integrates computer science, operations
 15 research, industrial engineering, business strat-
 16 egy, management sciences, and social and legal
 17 sciences, in order to encourage innovation in
 18 how organizations create value for customers
 19 and shareholders that could not be achieved
 20 through such disciplines working in isolation.

21 **SEC. 307. MEETING CRITICAL NATIONAL SCIENCE NEEDS.**

22 (a) IN GENERAL.—In addition to assessing the de-
 23 gree to which research award and grant proposals sub-
 24 mitted to the Foundation, and research activities initiated
 25 by the Foundation, sustain and strengthen the nation’s

1 traditional commitment to long-term basic research that
2 have the potential to be transformational to maintain the
3 flow of new ideas that fuel the economy, provide security,
4 and enhance the quality of life, to developing and sus-
5 taining a world class scientific workforce. and to fostering
6 the scientific literacy of its citizens, the Director of the
7 National Science Foundation shall include consideration
8 of the degree to which such awards and such research ac-
9 tivities may assist in meeting critical national needs in the
10 physical sciences, technology, engineering, and mathe-
11 matics.

12 (b) PRIORITY TREATMENT.—Proposed research ac-
13 tivities, and grants funded under the Foundation’s Re-
14 search and Related Activities Account, which can be ex-
15 pected to make contributions in physical and natural
16 sciences, technology, engineering, and mathematics, and
17 other research that underpins these areas, shall be given
18 priority in the selection of awards and in the allocation
19 of Foundation resources.

20 (c) APPLICATION OF PRIORITY TREATMENT TO
21 OTHER PROGRAMS.—This requirement shall be applied to
22 other fellowship, grant or award programs authorized in
23 this title.

1 **SEC. 308. EXPERIMENTAL PROGRAM TO STIMULATE COM-**
 2 **PETITIVE RESEARCH.**

3 Within the amounts authorized to be appropriated by
 4 section 301, there are authorized to be appropriated to
 5 the National Science Foundation for the Experimental
 6 Program to Stimulate Competitive Research authorized
 7 under section 113 of the National Science Foundation Au-
 8 thorization Act of 1988 (42 U.S.C. 1862g)—

- 9 (1) \$125,000,000 for fiscal year 2007; and
 10 (2) for each of fiscal years 2008 through 2011,
 11 an amount equal to \$125,000,000 increased for each
 12 such year by an amount equal to the percentage in-
 13 crease of the National Science Foundation's budget
 14 request above the total amount appropriated to the
 15 Foundation for fiscal year 2007.

16 **TITLE IV—NATIONAL AERO-**
 17 **NAUTICS AND SPACE ADMIN-**
 18 **ISTRATION**

19 **SEC. 401. NASA'S CONTRIBUTION TO INNOVATION.**

20 (a) SENSE OF THE CONGRESS.—It is the sense of the
 21 Congress that—

- 22 (1) since its establishment the National Aero-
 23 nautics and Space Administration has played an im-
 24 portant role in stimulating excellence in the advance-
 25 ment of physical science and engineering disciplines
 26 and in providing opportunities and incentives for the

1 pursuit of academine studies in science, technology,
2 engineering, and mathematics;

3 (2) a balanced science program as authorized
4 by section 101(d) of the National Aeronautics and
5 Space Administration Act 2005 (Public Law 109–
6 155) contributes significantly to innovation in and
7 the economic competitiveness of the United States;
8 and

9 (3) a robust National Aeronautics and Space
10 Administration, funded at the levels authorized
11 under sections 202 and 203 of that Act would offer
12 a fair balance among science, aeronautics, explo-
13 ration, and human space flight programs, all of
14 which can attract and employ scientists, engineers,
15 and technicians across a broad range of fields in
16 science, technology, mathematics, and engineering.

17 (b) PARTICIPATION IN INNOVATION AND COMPETI-
18 TIVENESS PROGRAMS.—The Administrator shall fully par-
19 ticipate in any interagency efforts to promote innovation
20 and economic competitiveness through scientific research
21 and development.

22 **SEC. 402. AERONAUTICS INSTITUTE FOR RESEARCH.**

23 (a) ESTABLISHMENT.—The Administrator of the Na-
24 tional Aeronautics and Space Administration shall estab-
25 lish within the Administration an Aeronautics Institute for

1 Research to manage the Aeronautics research of the Ad-
2 ministration. The Institute shall be headed by a director
3 with appropriate experience in aeronautics research and
4 development.

5 (b) DUTIES.—The Institute shall implement the pro-
6 grams authorized under Title IV of the National Aero-
7 nautics and Space Administration Authorization Act of
8 2005 (Public Law 109–155).

9 (c) COOPERATION WITH OTHER AGENCIES.—The
10 Institute shall operate in conjunction with relevant pro-
11 grams in the Department of Transportation, the Depart-
12 ment of Defense, the Department of Commerce, and the
13 Department of Homeland Security, including the activities
14 of the Joint Planning and Development Office established
15 under the VISION 100—Century of Aviation Reauthor-
16 ization Act (Public Law 108–176). The Director of the
17 Institute may accept assistance, staff, and funding from
18 those Departments and other Federal agencies. Such
19 funding shall be in addition to funds authorized for aero-
20 nautics under the National Aeronautics and Space Admin-
21 istration Authorization Act of 2005 (Public Law 109–
22 155). The Director of the Institute may utilize the Next
23 Generation Air Transportation Senior Policy Committee
24 established under section 710 of under the VISION 100—
25 Century of Aviation Reauthorization Act (Public Law

1 108–176) to coordinate its programs with other Depart-
2 ments and agencies.

3 (d) PARTNERSHIPS.—In developing and carrying out
4 its plans, the Institute shall consult with the public and
5 ensure the participation of experts from the private sector
6 including representatives of commercial aviation, general
7 aviation, aviation labor groups, aviation research and de-
8 velopment entities, aircraft and air traffic control sup-
9 pliers, and the space industry.

10 **SEC. 403. BASIC RESEARCH ENHANCEMENT.**

11 (a) IN GENERAL.—The Administrator of the Na-
12 tional Aeronautics and Space Administration, the Director
13 of the National Science Foundation, the Secretary of En-
14 ergy, the Secretary of Defense, and Secretary of Com-
15 merce shall, to the extent practicable, coordinate basic and
16 fundamental research activities related to physical
17 sciences, technology, engineering and mathematics.

18 (b) ESTABLISHMENT OF BASIC RESEARCH EXECU-
19 TIVE COUNCIL.—In order to ensure effective application
20 of resources to basic science activity and to facilitate coop-
21 erative basic and fundamental research activities with
22 other governmental organizations, the Administrator of
23 the National Aeronautics and Space Administration shall
24 establish within the Administration a Basic Research Ex-
25 ecutive Council to oversee the distribution and manage-

1 ment of programs and resources engaged in support of
2 basic research activity.

3 (c) MEMBERSHIP.—The membership of the Basic Re-
4 search Executive Council shall consist of the most senior
5 agency official representing each of the following areas of
6 research:

7 (1) Space Science.

8 (2) Earth Science.

9 (3) Life and Microgravity Sciences.

10 (4) Aeronautical Research.

11 (d) LEADERSHIP.—The Council shall be chaired by
12 an individual appointed for that purpose who shall have,
13 as a minimum, a appropriate graduate degree in a rec-
14 ognizable discipline in the physical sciences, and appro-
15 priate experience in the conduct and management of basic
16 research activity. The Chairman of the Council shall re-
17 port directly to the Administrator of the National Aero-
18 nautics and Space Administration.

19 (e) SUPPORTING RESOURCES AND PERSONNEL.—
20 The Chairman of the Council shall be provided with ade-
21 quate administrative staff support to conduct the activity
22 and functions of the Council.

23 (f) DUTIES.—The Basic Research Executive Council
24 shall have, at minimum, the following duties:

1 (1) To establish criteria for the identification of
2 research activity as basic in nature.

3 (2) To establish, in consultation with the Office
4 of Science and Technology Policy, the National
5 Science Foundation, the National Academy of
6 Sciences, the National Institutes of Health, and
7 other appropriate external organizations, a
8 prioritization of fundamental research activity to be
9 conducted by the National Aeronautics and Space
10 Administration, to be reviewed and updated on an
11 annual basis, taking into consideration evolving na-
12 tional research priorities.

13 (3) To monitor, review, and evaluate all basic
14 research activity of the National Aeronautics and
15 Space Administration for compliance with basic re-
16 search priorities established under paragraph (2).

17 (4) To make recommendations to the Adminis-
18 trator regarding adjustments in the basic research
19 activities of the Administration to ensure consistency
20 with the research priorities established under this
21 section.

22 (5) To provide an annual report to the Senate
23 Committee on Commerce, Science, and Transpor-
24 tation and the House of Representatives Committee
25 on Science outlining the activities of the Council

1 during the preceding year and the status of basic re-
2 search activity within the Administration. The initial
3 such report, to serve as a baseline document, shall
4 be provided within 90 days after the establishment
5 and initial operations of the Council.

6 **TITLE V—NATIONAL INSTITUTE**
7 **OF STANDARDS AND TECH-**
8 **NOLOGY**

9 **SEC. 501. AUTHORIZATION OF APPROPRIATIONS.**

10 There are authorized to be appropriated to the Sec-
11 retary of Commerce for the use of the National Institute
12 of Standards and Technology—

13 (1) for fiscal year 2007, \$639,646,000, of
14 which \$106,000,000 shall be used for the Hollings
15 Manufacturing Extension Partnership Program;

16 (2) for fiscal year 2008, \$703,611,000, of
17 which \$106,000,000 shall be used for the Hollings
18 Manufacturing Extension Partnership Program;

19 (3) for fiscal year 2009, \$773,972,000, of
20 which \$106,000,000 shall be used for the Hollings
21 Manufacturing Extension Partnership Program;

22 (4) for fiscal year 2010, \$851,369,000, of
23 which \$106,000,000 shall be used for the Hollings
24 Manufacturing Extension Partnership Program; and

1 (5) for fiscal year 2011, \$936,506,000, of
 2 which \$106,000,000 shall be used for the Hollings
 3 Manufacturing Extension Partnership Program.

4 **SEC. 502. AMENDMENTS TO THE STEVENSON-WYDLER**
 5 **TECHNOLOGY INNOVATION ACT OF 1980.**

6 (a) IN GENERAL.—Section 5 of the Stevenson-
 7 Wydler Technology Innovation Act of 1980 (15 U.S.C.
 8 3704) is repealed.

9 (b) CONFORMING AMENDMENTS.—

10 (1) Section 5314 of title 5, United States Code,
 11 is amended by striking “Under Secretary of Com-
 12 merce for Technology”.

13 (2) Section 4 of the Stevenson-Wydler Tech-
 14 nology Innovation Act of 1980 (15 U.S.C. 3703) is
 15 amended—

16 (A) by striking paragraphs (1) and (3);
 17 and

18 (B) by redesignating paragraphs (2)
 19 through (13) as paragraphs (1) through (11),
 20 respectively.

21 (3) Section 21(a) of the Stevenson-Wydler
 22 Technology Innovation Act of 1980 (15 U.S.C.
 23 3713(a)) is amended—

1 (A) by striking out “sections 5, 11(g), and
2 16” in paragraph (1) and inserting “sections
3 11(g) and 16”;

4 (B) by striking “\$500,000 is authorized
5 only for the purpose of carrying out the require-
6 ments of the Japanese technical literature pro-
7 gram established under section 5(d) of this
8 Act;”.

9 (4) Section 208 of the High-Performance Com-
10 puting Act of 1991 (15 U.S.C. 5528 is amended by
11 striking subsection (c) and redesignating subsection
12 (d) as subsection (c).

13 (5) Section 6(b)(4)(B)(v) of the Assistive Tech-
14 nology Act of 1998 (29 U.S.C. 3005(b)(4)(B)(v)) is
15 amended by striking “the Technology Administra-
16 tion of the Department of Commerce,” and inserting
17 “the National Institute of Standards and Tech-
18 nology,”.

19 **SEC. 503. INNOVATION ACCELERATION.**

20 (a) GRANT PROGRAM.—In order to implement sec-
21 tion 202 of this Act, the Director of the National Institute
22 of Standards and Technology shall—

23 (1) establish a program linked to the measure-
24 ment laboratories, to be known as the “Standards
25 and Technology Acceleration Research Program”, to

1 support and promote innovation in the United States
2 through high-risk, high-reward research; and

3 (2) set aside not less than 8 percent of the
4 funds available to the Institute each fiscal year for
5 the program.

6 (b) EXTERNAL FUNDING.—The Director shall ensure
7 that at least 80 percent of the funds available for the pro-
8 gram shall be used to award competitive, merit-reviewed
9 grants, cooperative agreements or contracts to public or
10 private entities, including businesses and universities. In
11 selecting these projects, the Director shall ensure that all
12 projects have scientific and technical merit and that any
13 resulting intellectual property shall vest in a company or
14 companies incorporated in the United States. Each exter-
15 nal project shall involve at least one small or medium-sized
16 business and the Director shall give priority to joint ven-
17 tures between small or medium-sized businesses and edu-
18 cational institutions. Any grant shall be for a period not
19 to exceed 3 years.

20 (c) COMPETITIONS.—The Director shall solicit pro-
21 posals annually to address areas of national need for high-
22 risk, high-reward research, as identified by the Director.

23 (d) ANNUAL REPORT.—Each year the Director shall
24 issue an annual report describing the program’s activities,
25 including include a description of the metrics upon which

1 grant funding decisions were made in the previous fiscal
2 year, any proposed changes to those metrics, metrics for
3 evaluating the success of ongoing and completed grants,
4 and an evaluation of ongoing and completed grants. The
5 first annual report shall include best practices for manage-
6 ment of programs to stimulate high-risk, high-reward re-
7 search.

8 (e) ADMINISTRATIVE EXPENSES.—No more than 5
9 percent of the finding available to the program may be
10 used for administrative expenses.

11 (f) HIGH-RISK, HIGH-REWARD RESEARCH DE-
12 FINED.—In this section, the term “high-risk, high-reward
13 research” means research that—

14 (1) has the potential for yielding results with
15 far-ranging or wide-ranging implications; and

16 (2) addresses critical national needs related to
17 measurement standards and technology; but

18 (3) is too novel or spans too diverse a range of
19 disciplines to fare well in the traditional peer review
20 process.

21 **SEC. 504. DEVELOPMENT OF ADVANCED MANUFACTURING**
22 **SYSTEMS.**

23 (a) RESEARCH AND DEVELOPMENT.—The Director
24 of the National Institute of Standards and Technology
25 shall support research and development in collaboration

1 with entities and organizations from the industrial sector
2 to supplement and support work in the private sector on
3 advanced manufacturing systems designed to increase pro-
4 ductivity and efficiency and to create competitive advan-
5 tages for United States businesses. These research and de-
6 velopment activities should focus on the following activi-
7 ties:

8 (1) Supporting industry efforts to develop inno-
9 vative, state-of-the-art manufacturing processes, ad-
10 vanced technologies through interoperable standards,
11 and related concepts, including—

12 (A) advanced distributed and desktop man-
13 ufacturing linked to and made compatible with
14 the extended production enterprise system de-
15 scribed in paragraph (2);

16 (B) non-contact quality inspection proc-
17 esses linked to and made compatible with the
18 extended production enterprise system;

19 (C) small lot manufacturing processes that
20 are—

21 (i) as cost-effective as mass produc-
22 tion processes; and

23 (ii) linked to and compatible with the
24 extended production enterprise system; and

1 (D) the use of state-of-the-art materials
2 and processes at the nanotechnological level.

3 (2) Supporting industry efforts to develop an
4 extended production enterprise system that inte-
5 grates key entities, including entities engaged in
6 product design and development, manufacturing,
7 sourcing, distribution, and user entities, including
8 through the development of—

9 (A) interoperable software and standards
10 designed to maximize the compatibility of the
11 design, modeling, and manufacturing stages of
12 the manufacturing process; and

13 (B) supply chain software.

14 (b) COORDINATION OF ACTIVITIES.—The Director
15 shall coordinate activities under subsection (a) with activi-
16 ties under—

17 (1) the Small Business Innovation Research
18 Program (as defined in section 2500(11) of title 10,
19 United States Code);

20 (2) the Small Business Technology Transfer
21 Program (as defined in section 2500(12) of title 10,
22 United States Code); and

23 (3) the Manufacturing Technology Program es-
24 tablished under section 2521 of title 10, United
25 States Code.

1 (c) TESTING.—The Director shall support the work
2 of entities and organizations from the industrial sector in
3 developing prototypes and testing areas for testing and re-
4 fining, in actual production conditions, the processes, tech-
5 nologies, and extended production enterprise system de-
6 scribed in subsection (a)(2) in order to maximize produc-
7 tivity gains and cost efficiencies.

8 (d) DEVELOPMENT OF STANDARDS.—The Director,
9 in coordination with entities and organizations from the
10 industrial sector and the Manufacturing Technology Pro-
11 gram, shall support standards to be used as manufac-
12 turing performance criteria to accelerate the adoption of
13 improvements and innovative processes and protocols de-
14 veloped under subsection (a).

15 (e) PILOT TEST BEDS OF EXCELLENCE.—

16 (1) ESTABLISHMENT.—The Director shall, in
17 collaboration with entities and organizations from
18 the industrial sector, support not more than 3 pilot
19 testbeds of excellence in manufacturing fields impor-
20 tant to advanced technologies developed under sub-
21 section (a), such as nanotechnology or fuel cell tech-
22 nology, to be used by the public and private sector.
23 The testbeds of excellence shall focus on production
24 development, particularly the invention, prototyping,

1 and engineering development stages of the manufac-
2 turing process.

3 (2) COMPETITION.—The Director shall conduct
4 a competition to select the pilot testbeds of excel-
5 lence based on criteria and metrics established by
6 the Secretary prior to the competition.

7 (3) FUNDING.—The Director may provide the
8 pilot testbeds of excellence selected pursuant to the
9 competition set forth in paragraph (2) with an ap-
10 propriate level of funding if and only if the following
11 conditions are satisfied:

12 (A) No more than $\frac{1}{3}$ of the funding of
13 each testbed of excellence is provided by the
14 Federal Government.

15 (B) At least $\frac{1}{3}$ of the cost of each testbed
16 of excellence is provided by participants from
17 the private sector.

18 (C) At least $\frac{1}{3}$ of the cost of each testbed
19 of excellence is provided by State or local gov-
20 ernments.

21 (4) REVIEW OF FUNDED TESTBEDS.—Within 3
22 years of the start of Federal funding for any testbed
23 of excellence pursuant to this section, the Director
24 shall use the metrics established pursuant to para-
25 graph (2) and any additional review metrics that the

1 Director determines appropriate to assess the per-
2 formance of the federally funded testbeds of excel-
3 lence. Any testbed of excellence that fails to satisfy
4 any of the performance metrics will be ineligible for
5 additional Federal funding.

6 (5) SUNSET PROVISION.—Federal funding of
7 any testbed of excellence shall cease 5 years after
8 the date of enactment of this Act.

9 (f) HOLLINGS MANUFACTURING EXTENSION PART-
10 NERSHIP FOCUS ON INNOVATION.—The Director of the
11 National Institute of Standards and Technology shall en-
12 sure that the Hollings Manufacturing Extension Partner-
13 ship program develops a focus on innovation, including
14 through technology diffusion, supply and distribution
15 chain integration, and the dissemination of the processes,
16 technologies, and extended production enterprise systems
17 developed under this section.

18 (g) EXTENDED PRODUCTION ENTERPRISE.—In this
19 section the term “extended production enterprise” means
20 a system in which key entities in the manufacturing chain,
21 including entities engaged in product design and develop-
22 ment, manufacturing, sourcing, distribution, and user en-
23 tities, are linked together through information technology
24 and other means to promote efficiency and productivity.

1 **SEC. 505. COLLABORATIVE MANUFACTURING RESEARCH**
2 **PILOT GRANTS.**

3 The National Institute of Standards and Technology
4 Act is amended—

5 (1) by redesignating the first section 32 (15
6 U.S.C. 271 note) as section 34 and moving it to the
7 end of the Act; and

8 (2) by inserting before the section moved by
9 paragraph (1) the following new section:

10 **“SEC. 33. COLLABORATIVE MANUFACTURING RESEARCH**
11 **PILOT GRANTS.**

12 “(a) **AUTHORITY.**—

13 “(1) **ESTABLISHMENT.**—The Director shall es-
14 tablish a pilot program of awards to partnerships
15 among participants described in paragraph (2) for
16 the purposes described in paragraph (3). Awards
17 shall be made on a peer-reviewed, competitive basis.

18 “(2) **PARTICIPANTS.**—Such partnerships shall
19 include at least—

20 “(A) 1 manufacturing industry partner;
21 and

22 “(B) 1 nonindustry partner.

23 “(3) **PURPOSE.**—The purpose of the program
24 under this section is to foster cost-shared collabora-
25 tions among firms, educational institutions, research
26 institutions, State agencies, and nonprofit organiza-

1 tions to encourage the development of innovative,
2 multidisciplinary manufacturing technologies. Part-
3 nerships receiving awards under this section shall
4 conduct applied research to develop new manufac-
5 turing processes, techniques, or materials that would
6 contribute to improved performance, productivity,
7 and competitiveness of United States manufacturing,
8 and build lasting alliances among collaborators.

9 “(b) PROGRAM CONTRIBUTION.—Awards under this
10 section shall provide for not more than one-third of the
11 costs of a partnership.

12 “(c) APPLICATIONS.—Applications for awards under
13 this section shall be submitted in such manner, at such
14 time, and containing such information as the Director
15 shall require. Such applications shall describe at a min-
16 imum—

17 “(1) how each partner will participate in devel-
18 oping and carrying out the research agenda of the
19 partnership;

20 “(2) the research that the grant would fund;
21 and

22 “(3) how the research to be funded with the
23 award would contribute to improved performance,
24 productivity, and competitiveness of the United
25 States manufacturing industry.

1 “(d) SELECTION CRITERIA.—In selecting applica-
2 tions for awards under this section, the Director shall con-
3 sider at a minimum—

4 “(1) the degree to which projects will have a
5 broad impact on manufacturing;

6 “(2) the novelty and scientific and technical
7 merit of the proposed projects; and

8 “(3) the demonstrated capabilities of the appli-
9 cants to successfully carry out the proposed re-
10 search.

11 “(e) DISTRIBUTION.—In selecting applications under
12 this section the Director shall ensure, to the extent prac-
13 ticable, a distribution of overall awards among a variety
14 of manufacturing industry sectors and a range of firm
15 sizes.

16 “(f) DURATION.—In carrying out this section, the Di-
17 rector shall run a single pilot competition to solicit and
18 make awards. Each award shall be for a 3-year period.”.

19 **SEC. 506. MANUFACTURING EXTENSION.**

20 (a) MANUFACTURING CENTER EVALUATION.—Sec-
21 tion 25(c)(5) of the National Institute of Standards and
22 Technology Act (15 U.S.C. 278k(c)(5)) is amended by in-
23 serting “A Center that has not received a positive evalua-
24 tion by the evaluation panel shall be notified by the panel
25 of the deficiencies in its performance and shall be placed

1 on probation for one year, after which time the panel shall
2 reevaluate the Center. If the Center has not addressed the
3 deficiencies identified by the panel, or shown a significant
4 improvement in its performance, the Director shall con-
5 duct a new competition to select an operator for the Cen-
6 ter or may close the Center.” after “at declining levels.”.

7 (b) FEDERAL SHARE.—Strike section 25(d) of the
8 National Institute of Standards and Technology Act (15
9 U.S.C. 278k(d)) and insert the following:

10 “(d) ACCEPTANCE OF FUNDS.—In addition to such
11 sums as may be appropriated to the Secretary and Direc-
12 tor to operate the Centers program, the Secretary and Di-
13 rector also may accept funds from other Federal depart-
14 ments and agencies and under section 2(c)(7) from the
15 private sector for the purpose of strengthening United
16 States manufacturing. Such funds from the private sector,
17 if allocated to a Center or Centers, shall not be considered
18 in the calculation of the Federal share of capital and an-
19 nual operating and maintenance costs under subsection
20 (c).”.

21 (c) HOLLINGS MANUFACTURING EXTENSION CEN-
22 TER COMPETITIVE GRANT PROGRAM.—Section 25 of the
23 National Institute of Standards and Technology Act (15
24 U.S.C. 278k) is amended by adding at the end the fol-
25 lowing new subsections:

1 “(e) COMPETITIVE GRANT PROGRAM.—

2 “(1) ESTABLISHMENT.—The Director shall es-
3 tablish, within the Hollings Manufacturing Exten-
4 sion Partnership program under this section and
5 section 26 of this Act, a program of competitive
6 awards among participants described in paragraph
7 (2) for the purposes described in paragraph (3).

8 “(2) PARTICIPANTS.—Participants receiving
9 awards under this subsection shall be the Centers, or
10 a consortium of such Centers.

11 “(3) PURPOSE.—The purpose of the program
12 under this subsection is to develop projects to solve
13 new or emerging manufacturing problems as deter-
14 mined by the Director, in consultation with the Di-
15 rector of the Hollings Manufacturing Extension
16 Partnership program, the Hollings Manufacturing
17 Extension Partnership National Advisory Board,
18 and small and medium-sized manufacturers. One or
19 more themes for the competition may be identified,
20 which may vary from year to year, depending on the
21 needs of manufacturers and the success of previous
22 competitions. These themes shall be related to
23 projects associated with manufacturing extension ac-
24 tivities, including supply chain integration and qual-

1 ity management, or extend beyond these traditional
2 areas.

3 “(4) APPLICATIONS.—Applications for awards
4 under this subsection shall be submitted in such
5 manner, at such time, and containing such informa-
6 tion as the Director shall require, in consultation
7 with the Hollings Manufacturing Extension Partner-
8 ship National Advisory Board.

9 “(5) SELECTION.—Awards under this sub-
10 section shall be peer reviewed and competitively
11 awarded. The Director shall select proposals to re-
12 ceive awards—

13 “(A) that utilize innovative or collaborative
14 approaches to solving the problem described in
15 the competition;

16 “(B) that will improve the competitiveness
17 of industries in the region in which the Center
18 or Centers are located; and

19 “(C) that will contribute to the long-term
20 economic stability of that region.

21 “(6) PROGRAM CONTRIBUTION.—Recipients of
22 awards under this subsection may be required to
23 provide a matching contribution.

24 “(f) AUDITS.—A center that receives assistance
25 under this section shall submit annual audits to the Sec-

1 retary in accordance with Office of Management and
2 Budget Circular A-133 and shall make such audits avail-
3 able to the public on request.”.

4 (d) PROGRAMMATIC AND OPERATIONAL PLAN.—Not
5 later than 120 days after the date of enactment of this
6 Act, the Director of the National Institute of Standards
7 and Technology shall transmit to the Committee on
8 Science of the House of Representatives and the Com-
9 mittee on Commerce, Science, and Transportation of the
10 Senate a 3-year programmatic and operational plan for
11 the Hollings Manufacturing Extension Partnership pro-
12 gram under sections 25 and 26 of the National Institute
13 of Standards and Technology Act (15 U.S.C. 278k and
14 278l). The plan shall include comments on the plan from
15 the Hollings Manufacturing Extension Partnership State
16 partners and the Hollings Manufacturing Extension Part-
17 nership National Advisory Board.

18 **SEC. 507. EXPERIMENTAL PROGRAM TO STIMULATE COM-**
19 **PETITIVE TECHNOLOGY.**

20 (a) IN GENERAL.—The Director of the National In-
21 stitutes of Standards and Technology shall re-establish the
22 Experimental Program to Stimulate Competitive Tech-
23 nology. The purpose of the program shall be to strengthen
24 the technological competitiveness of those States that have

1 historically received less Federal research and development
2 funds than a majority of the States have received.

3 (b) ARRANGEMENTS.—In carrying out the program,
4 the Director shall cooperate with State, regional, or local
5 science and technology-based economic development orga-
6 nization and with representatives of small business firms
7 and other appropriate technology-based businesses.

8 (c) GRANTS AND COOPERATIVE AGREEMENTS.—In
9 carrying out the program, the Director may make grants
10 or enter into cooperative agreements to provide for—

- 11 (1) technology research and development;
- 12 (2) technology transfer from university re-
13 search;
- 14 (3) technology deployment and diffusion; and
- 15 (4) the strengthening of technological and inno-
16 vation capabilities through consortia comprised of—
 - 17 (A) technology-based small business firms;
 - 18 (B) industries and emerging companies;
 - 19 (C) institutions of higher education includ-
20 ing community colleges; and
 - 21 (D) State and local development agencies
22 and entities.

23 (d) REQUIREMENTS FOR MAKING AWARDS.—

24 (1) IN GENERAL.—In making awards under
25 this section, the Director shall ensure that the

1 awards are awarded on a competitive basis that in-
2 cludes a review of the merits of the activities that
3 are the subject of the award, giving special emphasis
4 to those projects which will increase the participa-
5 tion of women and underrepresented groups in
6 science and technology.

7 (2) MATCHING REQUIREMENT.—The non-Fed-
8 eral share of the activities (other than planning ac-
9 tivities) carried out under an award under this sub-
10 section shall be not less than 50 percent of the cost
11 of those activities.

12 (e) CRITERIA FOR STATES.—The Director shall es-
13 tablish criteria for achievement by each State that partici-
14 pates in the program. Upon the achievement of all such
15 criteria, a State shall cease to be eligible to participate
16 in the program.

17 (f) COORDINATION.—To the extent practicable, in
18 carrying out this subsection, the Director shall coordinate
19 the program with other programs of the Department of
20 Commerce.

21 (g) REPORT.—

22 (1) IN GENERAL.—Not later than 90 days after
23 the enactment of this act, the Director shall prepare
24 and submit a report that meets the requirements of
25 this paragraph to the Senate Committee on Com-

1 merce, Science, and Transportation and the House
2 of Representatives Committee on Science.

3 (2) REQUIREMENTS FOR REPORT.—The report
4 prepared under this paragraph shall contain—

5 (A) a description of the structure and pro-
6 cedures of the program;

7 (B) a management plan for the program;

8 (C) a description of the merit-based review
9 process to be used in the program;

10 (D) milestones for the evaluation of activi-
11 ties to be assisted under the program in fiscal
12 year 2008;

13 (E) an assessment of the eligibility of each
14 State that participates in the Experimental
15 Program to Stimulate Competitive Research of
16 the National Science Foundation to participate
17 in the program under this subsection; and

18 (F) the evaluation criteria with respect to
19 which the overall management and effectiveness
20 of the program will be evaluated.

21 **SEC. 508. TECHNICAL AMENDMENTS TO THE NATIONAL IN-**
22 **STITUTE OF STANDARDS AND TECHNOLOGY**
23 **ACT AND OTHER TECHNICAL AMENDMENTS.**

24 (a) RESEARCH FELLOWSHIPS.—Section 18 of the
25 National Institute of Standards and Technology Act (15

1 U.S.C. 278g–1) is amended by striking “up to 1 per cen-
2 tum of the” in the first sentence.

3 (b) FINANCIAL AGREEMENTS.—

4 (1) CLARIFICATION.—Section 2(b)(4) of the
5 National Institute of Standards and Technology Act
6 (15 U.S.C. 272(b)(4)) is amended by inserting “and
7 grants and cooperative agreements,” after “arrange-
8 ments,”.

9 (2) MEMBERSHIPS.—Section 2(c) of the Na-
10 tional Institute of Standards and Technology Act
11 (15 U.S.C. 272(c)) is amended—

12 (A) by striking “and” after the semicolon
13 in paragraph (21);

14 (B) by redesignating paragraph (22) as
15 paragraph (23); and

16 (C) by inserting after paragraph (21) the
17 following:

18 “(22) notwithstanding subsection (b)(4) of this
19 section, the Grants and Cooperative Agreements Act
20 (31 U.S.C. 6301–6308), the Competition in Con-
21 tracting Act (31 U.S.C. 3551–3556), and the Fed-
22 eral Acquisition Regulations set forth in title 48,
23 Code of Federal Regulations, to expend appropriated
24 funds for National Institute of Standards and Tech-
25 nology memberships in scientific organizations, reg-

1 istration fees for attendance at conferences, and
2 sponsorship of conferences in furtherance of tech-
3 nology transfer; and”.

4 (c) WORKING CAPITAL FUND.—Section 12 of the
5 National Institute of Standards and Development Act (15
6 U.S.C. 278b) is amended by adding at the end the fol-
7 lowing:

8 “(g) AMOUNT AND SOURCE OF TRANSFERS.—Not to
9 exceed one-quarter per centum of the amounts appro-
10 priated to the Institute for any fiscal year may be trans-
11 ferred to the fund, in addition to any other transfer au-
12 thority. In addition, funds provided to the Institute from
13 other Federal agencies for the purpose of production of
14 Standard Reference Materials may be transferred to the
15 fund.”.

16 (d) OUTDATED SPECIFICATIONS.—

17 (1) REDEFINITION OF METRIC SYSTEM.—The
18 Metric System Act of 1866 (15 U.S.C. 205; 14 Stat.
19 339, 340) is amended by striking the text of section
20 2 and inserting the following:

21 “The metric system of measurement shall be defined
22 as the International System of Units as established in
23 1960, and subsequently maintained, by the General Con-
24 ference of Weights and Measures, and as interpreted or

1 modified for the United States by the Secretary of Com-
2 merce.”.

3 (2) REPEAL OF REDUNDANT AND OBSOLETE
4 AUTHORITY.—The Act of July 21, 1950, entitled,
5 “An Act To redefine the units and establish the
6 standards of electrical and photometric measure-
7 ments of 1950” (15 U.S.C. 223, 224) is hereby re-
8 pealed.

9 (3) STANDARD TIME.—The first section of the
10 Act of March 19, 1918, (15 U.S.C 261; commonly
11 known as the Calder Act) is amended—

12 (A) by inserting “(a) IN GENERAL.—” be-
13 fore “For the purpose”;

14 (B) by striking the second sentence and
15 the extra period after it and inserting “Except
16 as provided in section 3(a) of the Uniform Time
17 Act of 1966, the standard time of the first zone
18 shall be Coordinated Universal Time retarded
19 by 4 hours; that of the second zone retarded by
20 5 hours; that of the third zone retarded by 6
21 hours; that of the fourth zone retarded by 7
22 hours; that of the fifth zone retarded 8 hours;
23 that of the sixth zone retarded by 9 hours; that
24 of the seventh zone retarded by 10 hours; that
25 of the eighth zone retarded by 11 hours; and

1 that of the ninth zone shall be Coordinated
2 Universal Time advanced by 10 hours.”; and

3 (C) adding at the end the following:

4 “(b) COORDINATED UNIVERSAL TIME DEFINED.—In
5 this section, the term ‘Coordinated Universal Time’ means
6 the time scale maintained through the General Conference
7 of Weights and Measures and interpreted or modified for
8 the United States by the Secretary of Commerce.’.

9 (e) RETENTION OF DEPRECIATION SURCHARGE.—
10 Section 14 of the National Institute of Standards and
11 Technology Act (15 U.S.C. 278d) is amended—

12 (1) by inserting “(a) IN GENERAL.—” before
13 “Within”; and

14 (2) adding at the end the following:

15 “(b) RETENTION OF FEES.—The Director is author-
16 ized to retain all building use and depreciation surcharge
17 fees collected pursuant to OMB Circular A-25. Such fees
18 shall be collected and credited to the Construction of Re-
19 search Facilities Appropriation Account for use in mainte-
20 nance and repair of National Institute of Standards and
21 Technology’s existing facilities.”.

22 (f) NON-ENERGY INVENTIONS PROGRAM.—Section
23 28 of the National Institute of Standards and Technology

1 Act, as redesignated by section 202 of this Act (formerly
2 15 U.S.C. 278m), is repealed.

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