109TH CONGRESS
2D SESSION

S. 2390

To provide a national innovation initiative.

IN THE SENATE OF THE UNITED STATES

MARCH 8, 2006

Mr. ENSIGN (for himself, Mr. LIEBERMAN, Mr. LUGAR, Mr. BINGAMAN, Ms. STABENOW, Mr. KERRY, Mr. DEWINE, Mr. ALLEN, Mr. NELSON of Florida, Mr. ROCKEFELLER, Mr. CHAMBLISS, and Mrs. CLINTON) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

---

A BILL

To provide a national innovation initiative.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''National Innovation Act—Commerce Provisions''.

SEC. 2. FINDINGS AND PURPOSES.

(a) FINDINGS.—Congress makes the following findings:

(1) The United States is the most innovative Nation in the world. Since our Nation's founding,

exploration, opportunity, and discovery have remained essential to fulfilling our Nation's strategic economic and political objectives.

(2) In the 21st century, a well-educated and trained workforce, investment in research and development, and a regulatory and physical infrastructure that supports innovators are essential to ensuring that the United States continues to lead the global economy on innovation.

(3) America's future economic and national security will largely depend on the creativity and commitment of our Nation to unleash its innovation capacity.

(4) The world has become dramatically more interconnected and competitive. Cutting edge research, world-class education, and highly skilled labor pools are no longer within the sole purview of the United States.

(5) The United States investment in basic research is currently insufficient to meet the challenges we face.

(6) Federal support for basic research in the physical sciences has consistently lagged behind that given to the life sciences in recent years.

(7) Traditional measurements of innovation capacity focused solely on inputs, such as research and development spending, number of patents and value of physical infrastructure. The traditional measurements are necessary but are not sufficient metrics for innovation in the 21st century's knowledge economy.

(8) Current Federal budget constraints require prioritization of spending and new programs must be funded through existing funds or through identifiable funding offsets whenever possible.

(9) A national, private sector-led, and government supported plan is required if the United States is to adequately respond to the challenges of increased global competition and take advantage of the opportunities this changing global dynamic presents.

(b) PURPOSES.—The purposes of this Act are to—

(1) make innovation a fundamental economic priority for the United States;

(2) create the most fertile policy environment for innovation to occur;

(3) increase the Federal Government's investment in basic research, especially in the physical sciences;

(4) direct greater funding toward multidisciplinary and frontier research where tomorrow's innovations are most likely to occur; and

(5) secure a strong advanced manufacturing base in the United States to ensure that as innovations occur, America is poised to reap the benefits via the creation of new jobs and investment.

SEC. 3. DEFINITIONS.

In this Act:

(1) EXECUTIVE AGENCY.—The term ''Executive agency'' has the meaning given that term in section 105 of title 5, United States Code.

(2) EXTENDED PRODUCTION ENTERPRISE.—The term ''extended production enterprise'' means a system in which key entities in the manufacturing chain, including entities engaged in product design and development, manufacturing, sourcing, distribution, and user entities, are linked together through information technology and other means to promote efficiency and productivity.

(3) INNOVATION.—The term ''innovation'' means the intersection of invention and insight leading to the creation of social and economic value, including through efforts meeting fundamental tech-

nology challenges and involving multidisciplinary work and a high degree of novelty.

(4) MANUFACTURING EXTENSION PARTNERSHIP PROGRAM.—The term ''Manufacturing Extension Partnership Program'' means the Manufacturing Extension Partnership Program of the Department of Commerce.

(5) MANUFACTURING TECHNOLOGY PROGRAM.—The term ''Manufacturing Technology Program'' means the Manufacturing Technology Program under section 2521 of title 10, United States Code.

(6) REGIONAL INNOVATION HOT SPOTS DEFINED.—The term ''regional innovation hot spots'' means regions that are defined by a high degree of innovation and the availability of talent, investment, and infrastructure necessary to create and sustain such innovation.

(7) SERVICE SCIENCE.—The term ''service science'' means curriculums, research programs, and training regimens, including service sciences, management, and engineering (SSME) programs, that exist or that are being developed to teach individuals to apply technology, organizational process manage-

ment, and industry-specific knowledge to solve complex problems.

(8) SMALL BUSINESS INNOVATION RESEARCH PROGRAM.—The term ''Small Business Innovation Research Program'' has the meaning given that term in section 2500(11) of title 10, United States Code.

(9) SMALL BUSINESS TECHNOLOGY TRANSFER PROGRAM.—The term ''Small Business Technology Transfer Program'' has the meaning given that term in section 2500(12) of title 10, United States Code.

(10) SSME.—The term ''SSME'' means the discipline known as service sciences, management, and engineering that—

(A) applies scientific, engineering and management disciplines to tasks that one organization performs beneficially for others, generally as part of the services sector of the economy; and

(B) integrates computer science, operations research, industrial engineering, business strategy, management sciences, and social and legal sciences, in order to encourage innovation in how organizations create value for customers

and shareholders that could not be achieved through such disciplines working in isolation.

SEC. 4. PRESIDENT'S COUNCIL ON INNOVATION.

(a) IN GENERAL.—The President shall establish a President's Council on Innovation (in this section referred to as the ''Council'').

(b) DUTIES.—The Council's duties shall include—

(1) monitoring implementation of legislative proposals and initiatives for promoting innovation, including policies related to research funding, taxation, immigration, trade, and education that are proposed in this and other Acts;

(2) in consultation with the Director of the Office of Management and Budget, developing a process for using metrics to assess the impact of existing and proposed policies and rules that affect innovation capabilities in the United States;

(3) identifying opportunities and making recommendations for the heads of executive agencies to improve innovation, monitoring, and reporting on the implementation of such recommendations;

(4) developing metrics for measuring the progress of the Federal Government with respect to improving conditions for innovation, including

through talent development, investment, and infrastructure improvements; and

(5) submitting an annual report to the President and Congress on such progress.

(c) MEMBERSHIP AND COORDINATION.—

(1) MEMBERSHIP.—The Council shall be composed of the Secretary or head of each of the following:

(A) The Department of Commerce.

(B) The Department of Defense.

(C) The Department of Education.

(D) The Department of Energy.

(E) The Department of Health and Human Services.

(F) The Department of Homeland Security.

(G) The Department of Labor.

(H) The Department of the Treasury.

(I) The National Aeronautics and Space Administration.

(J) The Securities and Exchange Commission.

(K) The National Science Foundation.

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

(M) The Office of Management and Budget.

(N) The Office of Science and Technology Policy.

(2) CHAIRPERSON.—The Secretary of Commerce shall serve as chairperson of the Council.

(3) COORDINATION.—The chairperson of the Council shall ensure appropriate coordination between the Council and the National Economic Council and the National Security Council.

(d) DEVELOPMENT OF INNOVATION AGENDA.—

(1) IN GENERAL.—The Council shall develop a comprehensive agenda for strengthening the innovation capabilities of the Federal Government and State governments, academia, and the private sector in the United States.

(2) CONSULTATION.—The comprehensive agenda required by paragraph (1) shall be developed in consultation with appropriate representatives of the private sector, scientific organizations, and academic organizations.

SEC. 5. INNOVATION ACCELERATION GRANTS.

(a) GRANT PROGRAM.—The President shall establish a grant program, to be known as the ''Innovation Acceleration Grants Program'', to support and promote innova-

tion in the United States. Priority in the awarding of grants shall be given to projects that meet fundamental technology challenges and that involve multidisciplinary work and a high degree of novelty.

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

(1) FUNDING GOALS.—The President shall ensure that it is the goal of each Executive agency that finances research in science, mathematics, engineering, and technology to allocate at least 3 percent of the agency's total annual research and development budget to funding grants under the Innovation Acceleration Grants Program.

(2) ADMINISTRATION.—

(A) IN GENERAL.—Each head of an Executive agency awarding grants under paragraph (1) shall submit a plan for implementing the grant program within such Executive agency to the Director of the Office of Science and Technology Policy and the Director of the Office of Management and Budget. The implementation plan shall be submitted not later than 90 days after the date of enactment of this Act. The implementation plan may incorporate existing initiatives of the Executive agencies that promote

research in innovation as described in subsection (a).

(B) REQUIRED METRICS.—The head of each Executive agency submitting an implementation plan pursuant to this section shall include metrics upon which grant funding decisions will be made and metrics for assessing the success of the grants awarded.

(C) GRANT DURATION AND RENEWALS.—

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

(ii) EVALUATION.—Not later than 90 days prior to the expiration of a grant issued under this section, the Executive agency that approved the grant shall complete an evaluation of the effectiveness of the grant based on the metrics established pursuant to subparagraph (B). In its evaluation, the Executive agency shall consider the extent to which the program funded by the grant met the goals of quality improvement and job creation.

(iii) PUBLICATION OF REVIEW.—The Executive agency shall publish and make

available to the public the review of each grant approved pursuant to this section.

(iv) FAILURE TO MEET METRICS.—Any grant that the Executive agency awarding the grant determines has failed to satisfy any of the metrics developed pursuant to subparagraph (B), shall not be eligible for a renewal.

(v) RENEWAL.—A grant issued under this section that satisfies all of the metrics developed pursuant to subparagraph (B), may be renewed once for a period not to exceed 3 years. Additional renewals may be considered only if the head of the Executive agency makes a specific finding that the program being funded involves a significant technology advance that requires a longer timeframe to complete critical research, and the research satisfies all the metrics developed pursuant to subparagraph (B).

SEC. 6. A NATIONAL COMMITMENT TO BASIC RESEARCH.

(a) PLAN FOR INCREASED RESEARCH.—Not later than 180 days after the date of the enactment of this Act, the Director of the National Science Foundation shall sub-

mit to Congress a comprehensive, multiyear plan that describes how the funds authorized in subsection (b) shall be used. Such plan shall be developed with a focus on utilizing basic research in physical science and engineering to optimize the United States economy as a global competitor and leader in productive innovation.

(b) INCREASED FUNDING FOR NATIONAL SCIENCE FOUNDATION.—There are authorized to be appropriated to the National Science Foundation for the purpose of doubling research funding the following amounts:

(1) $6,440,000,000 for fiscal year 2007.

(2) $7,280,000,000 for fiscal year 2008.

(3) $8,120,000,000 for fiscal year 2009.

(4) $8,960,000,000 for fiscal year 2010.

(5) $9,800,000,000 for fiscal year 2011.

(c) RECOMMENDATIONS FOR RESEARCH AND DEVELOPMENT FUNDING.—Not later than 1 year after the date of the enactment of this Act, the Director of the Office of Science and Technology Policy shall evaluate and, as appropriate, submit to Congress recommendations for an increase in funding for research and development in physical sciences and engineering in consultation with agencies and departments of the United States with significant research and development budgets.

SEC. 7. REGIONAL ECONOMIC DEVELOPMENT.

(a) DEVELOPMENT OF FUNDING STRATEGY.—

(1) IN GENERAL.—The Assistant Secretary for Economic Development of the Department of Commerce shall review Federal programs that support local economic development and prepare and implement a strategy to focus funding on initiatives that improve the ability of communities to participate successfully in the modern economy through innovation. In preparing the strategy, priority should be given to projects that—

(A) emphasize private sector cooperation with State and local governments and nonprofit organizations focused on regional economic development as the means of achieving specific objectives related to the support and promotion of innovation; and

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

(2) COORDINATION.—The Assistant Secretary shall coordinate the development and implementation of the strategy with the activities carried out by the Under Secretary for Technology under subsection (d).

(b) EVALUATION OF PROGRAMS.—The Assistant Secretary for Economic Development of the Department of

Commerce shall develop metrics to measure the success of Federal programs in supporting and promoting innovation at the local community level while minimizing bureaucracy and overhead expenses.

(c) PROMOTION OF ECONOMIC DEVELOPMENT OPPORTUNITIES.—The Assistant Secretary for Economic Development of the Department of Commerce should work with organizations focused on economic development to highlight opportunities for such organizations to serve local communities through grants focused on economic development and investment in companies pursuing innovation.

(d) REGIONAL INNOVATION HOT SPOTS.—

(1) PROMOTION OF REGIONAL INNOVATION HOT SPOTS.—The Under Secretary for Technology of the Department of Commerce shall coordinate activities focused on promoting innovation through the development of regional innovation hot spots.

(2) GUIDE TO DEVELOPING SUCCESSFUL REGIONAL INNOVATION HOT SPOTS.—

(A) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, the Secretary of Commerce, in consultation with representatives of regional innovation hot spots, shall publish a report, to be titled the ''Guide

to Developing Successful Regional Innovation Hot Spots'', that examines successful regional innovation hot spots and includes recommendations for establishing and fostering regional innovation hot spots.

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

(i) include information on the evaluation of human capital;

(ii) include information on the role of sponsoring institutions, such as universities, nonprofit organizations, and laboratories, in establishing and fostering regional innovation hot spots;

(iii) include information on the role of State and local government leaders, leaders in the research and business communities, and community organizations in establishing and fostering regional innovation hot spots;

(iv) discuss the importance of collaboration by public and private sector leaders;

(v) identify sources of funding for these activities within Federal, State, and

local governments and the private sector; and

(vi) include recommendations for developing strategic plans to stimulate innovation, including recommendations relating to knowledge transfer and commercialization, the support of regional entrepreneurship and increased innovation within existing regional firms, and the linking of primary institutions engaged in the innovation process.

(3) REGIONAL INNOVATION HOT SPOT METRICS.—

(A) DEVELOPMENT OF METRICS.—In conjunction with publishing the report required under paragraph (2), the Secretary of Commerce shall develop the following sets of metrics:

(i) Metrics to be considered for identifying potential regional innovation hot spots (in this subsection referred to as ''identifying metrics'').

(ii) Metrics to be considered for evaluating the impact and effectiveness of established regional innovation hot spots (in this

subsection referred to as ''evaluation metrics'').

(B) USE OF METRICS.—The Under Secretary of Commerce for Technology shall use the identifying metrics to conduct biannual assessments of potential regional clusters and shall use the evaluation metrics to assess the impact and effectiveness of established regional innovation hot spots in improving the regional economy and regional job market. The Under Secretary shall also assess the cost effectiveness of operating within each regional hot spot. The Under Secretary shall report the biannual assessments to Congress.

SEC. 8. DEVELOPMENT OF ADVANCED MANUFACTURING SYSTEMS.

(a) RESEARCH AND DEVELOPMENT.—The Director of the National Institute of Standards and Technology shall support research and development in collaboration with entities and organizations from the industrial sector to supplement and support work in the private sector on advanced manufacturing systems designed to increase productivity and efficiency and to create competitive advantages for United States businesses. These research and de-

velopment activities should focus on the following activities:

(1) Supporting industry efforts to develop innovative, state-of-the-art manufacturing processes, advanced technologies through interoperable standards, and related concepts, including—

(A) advanced distributed and desktop manufacturing linked to and made compatible with the extended production enterprise system described in paragraph (2);

(B) non-contact quality inspection processes linked to and made compatible with the extended production enterprise system;

(C) small lot manufacturing processes that are—

(i) as cost-effective as mass production processes; and

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

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

(2) Supporting industry efforts to develop an extended production enterprise system that integrates key entities, including entities engaged in product design and development, manufacturing,

sourcing, distribution, and user entities, including through the development of—

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

(B) supply chain software.

(b) COORDINATION OF ACTIVITIES.—The Director of the National Institute of Standards and Technology shall coordinate activities under subsection (a) with activities under—

(1) the Small Business Innovation Research Program;

(2) the Small Business Technology Transfer Program; and

(3) the Manufacturing Technology Program of the Department of Defense.

(c) TESTING.—The Director of the National Institute of Standards and Technology shall support the work of entities and organizations from the industrial sector in developing prototypes and testing areas for testing and refining, in actual production conditions, the processes, technologies, and extended production enterprise system described in subsection (a)(2) in order to maximize productivity gains and cost efficiencies.

(d) DEVELOPMENT OF STANDARDS.—The Director of the National Institute of Standards and Technology, in coordination with entities and organizations from the industrial sector and the Manufacturing Technology Program, shall support standards to be used as manufacturing performance criteria to accelerate the adoption of improvements and innovative processes and protocols developed under subsection (a).

(e) PILOT TEST BEDS OF EXCELLENCE.—

(1) ESTABLISHMENT.—The Director of the National Institute of Standards and Technology shall, in collaboration with entities and organizations from the industrial sector, support not more than 3 pilot test beds of excellence in manufacturing fields important to advanced technologies developed under subsection (a), such as nanotechnology, to be used by the public and private sector. The test beds of excellence shall focus on production development, particularly the invention, prototyping, and engineering development stages of the manufacturing process.

(2) COMPETITION.—The Secretary of Commerce shall conduct a competition to select the pilot test beds of excellence based on criteria and metrics established by the Secretary prior to the competition.

(3) FUNDING.—The Secretary of Commerce may provide the pilot test beds of excellence selected pursuant to the competition set forth in paragraph (2) with an appropriate level of funding if and only if the following conditions are satisfied:

(A) No more than ⅓ of the funding of each test bed of excellence is provided by the Federal Government.

(B) At least ⅓ of the cost of each test bed of excellence is provided by participants from the private sector.

(C) At least ⅓ of the cost of each test bed of excellence is provided by State or local governments.

(4) REVIEW OF FUNDED TEST BEDS.—Within 3 years of the start of Federal funding for any test bed of excellence pursuant to this section, the Secretary of Commerce shall use the metrics established pursuant to paragraph (2) and any additional review metrics that the Secretary determines appropriate to assess the performance of the federally funded test beds of excellence. Any test bed of excellence that fails to satisfy any of the performance metrics will be ineligible for additional Federal funding.

(5) SUNSET PROVISION.—Federal funding of any test bed of excellence shall cease 5 years after the date of enactment of this Act.

(f) MANUFACTURING EXTENSION PARTNERSHIP FOCUS ON INNOVATION.—The Director of the National Institute of Standards and Technology shall ensure that the Manufacturing Extension Partnership program develops a focus on innovation, including through technology diffusion, supply and distribution chain integration, and the dissemination of the processes, technologies, and extended production enterprise systems developed under this section.

(g) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Department of Commerce for the purpose of carrying out activities under this section the following amounts:

(1) $20,000,000 for fiscal year 2007.

(2) $40,000,000 for fiscal year 2008.

(3) $60,000,000 for fiscal year 2009.

(4) $80,000,000 for fiscal year 2010.

(5) $100,000,000 for fiscal year 2011.

SEC. 9. STUDY ON SERVICE SCIENCE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that, in order to strengthen the competitiveness of United States enterprises and institutions and to prepare

the people of the United States for high-wage, high-skill employment, the Federal Government should better understand and respond strategically to the emerging vocation and learning discipline known as service science.

(b) STUDY.—Not later than 270 days after the date of the enactment of this Act, the Director of the National Science Foundation shall conduct a study and report to Congress regarding how the Federal Government should support, through research, education, and training, the new discipline of service science.

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

○