Calendar No. 183

116TH CONGRESS
1ST SESSION

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[Report No. 116–80]

To improve the productivity and energy efficiency of the manufacturing sector by directing the Secretary of Energy, in coordination with the National Academies and other appropriate Federal agencies, to develop a national smart manufacturing plan and to provide assistance to small- and medium-sized manufacturers in implementing smart manufacturing programs, and for other purposes.

IN THE SENATE OF THE UNITED STATES

MARCH 7, 2019

Mrs. SHAHEEN (for herself, Mr. ALEXANDER, and Ms. HASSAN) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

SEPTEMBER 10, 2019

Reported by Ms. MURKOWSKI, without amendment

A BILL

To improve the productivity and energy efficiency of the manufacturing sector by directing the Secretary of Energy, in coordination with the National Academies and other appropriate Federal agencies, to develop a national smart manufacturing plan and to provide assistance to small- and medium-sized manufacturers in implementing smart manufacturing programs, and for other purposes.

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 ''Smart Manufacturing Leadership Act''.

SEC. 2. FINDINGS.

Congress finds that—

(1) the industrial sector—

(A) represents approximately 20 percent of the economy of the United States;

(B) provides approximately 13 percent of employment in the United States; and

(C) accounts for more than 30,000,000,000,000,000 Btus of energy, a quantity that is equal to almost ⅓ of the energy consumption of the United States;

(2) smart manufacturing is set to transform the manufacturing sector and the use by the manufacturing sector of energy, water, raw materials, and labor over the 10 years following the date of enactment of this Act;

(3) the transformation described in paragraph (2) will result in savings in electricity, natural gas, transportation fuels, chemical feedstocks, and many other fuels;

(4) the interconnection of the many components of manufacturing within a manufacturing plant with other business functions within a company and across companies within a supply chain will enable new production efficiencies;

(5) the improvements in automation described in paragraph (4) are estimated to produce between $5,000,000,000 and $25,000,000,000 in energy savings per year across the manufacturing sector for electricity alone by 2035;

(6) smart manufacturing technologies are estimated to add between $10,000,000,000,000 and $15,000,000,000,000 to the global gross domestic product over 20 years following the date of enactment of this Act;

(7) market barriers exist to the widespread adoption of smart manufacturing practices by all sizes of firms and to the investment in smart manufacturing technologies, including lack of—

(A) common communication protocols between smart manufacturing devices, which prevents interoperability, reduces system efficiencies, and stifles innovation;

(B) common standards for storing and sharing information relating to energy consumption and energy savings;

(C) an open-access smart manufacturing platform that enables the networking of business and automation systems of multiple vendors; and

(D) common cybersecurity protocols and standards;

(8) addressing the barriers described in paragraph (7) is in the interest of the United States;

(9) in response to the barriers described in paragraph (7), the Secretary of Energy is working with the private sector to reduce the market barriers through the development of voluntary protocols and standards;

(10) there exist many technologies of which many domestic manufacturers are unaware that could—

(A) improve the competitiveness of the domestic manufacturers; and

(B) reduce the environmental impacts of the domestic manufacturers;

(11) Federal agency action can facilitate greater economic growth through outreach and engage-

ment in the smart manufacturing technology area; and

(12) the United States would benefit from a concerted and focused effort to advance the adoption of smart manufacturing throughout the manufacturing sector of the United States.

SEC. 3. DEFINITIONS.

In this Act:

(1) ENERGY MANAGEMENT SYSTEM.—The term ''energy management system'' means a business management process based on standards of the American National Standards Institute that enables an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, security, use, and consumption.

(2) INDUSTRIAL ASSESSMENT CENTER.—The term ''industrial assessment center'' means a center located at an institution of higher education that—

(A) receives funding from the Department of Energy;

(B) provides an in-depth assessment of small- and medium-size manufacturer plant sites to evaluate the facilities, services, and manufacturing operations of the plant site; and

(C) identifies opportunities for potential savings for small- and medium-size manufacturer plant sites from energy efficiency improvements, waste minimization, pollution prevention, and productivity improvement.

(3) INFORMATION AND COMMUNICATION TECHNOLOGY.—The term ''information and communication technology'' means any electronic system or equipment (including the content contained in the system or equipment) used to create, convert, communicate, or duplicate data or information, including computer hardware, firmware, software, communication protocols, networks, and data interfaces.

(4) INSTITUTION OF HIGHER EDUCATION.—The term ''institution of higher education'' has the meaning given the term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(5) NATIONAL LABORATORY.—The term ''National Laboratory'' has the meaning given the term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

(6) NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM.—The term ''North American Industry Classification System'' means the standard used by Federal statistical agencies in classifying business

establishments for the purpose of collecting, analyzing, and publishing statistical data relating to the business economy of the United States.

(7) SECRETARY.—The term ''Secretary'' means the Secretary of Energy.

(8) SMALL AND MEDIUM MANUFACTURERS.—The term ''small and medium manufacturers'' means manufacturing firms—

(A) classified in the North American Industry Classification System as any of sectors 31 through 33;

(B) with gross annual sales of less than $100,000,000;

(C) with fewer than 500 employees at the plant site; and

(D) with annual energy bills totaling more than $100,000 and less than $2,500,000.

(9) SMART MANUFACTURING.—The term ''smart manufacturing'' means advanced technologies in information, automation, monitoring, computation, sensing, modeling, and networking that—

(A) digitally—

(i) simulate manufacturing production lines;

(ii) operate computer-controlled manufacturing equipment;

(iii) monitor and communicate production line status; and

(iv) manage and optimize energy productivity and cost throughout production;

(B) model, simulate, and optimize the energy efficiency of a factory building;

(C) monitor and optimize building energy performance;

(D) model, simulate, and optimize the design of energy efficient and sustainable products, including the use of digital prototyping and additive manufacturing to enhance product design;

(E) connect manufactured products in networks to monitor and optimize the performance of the networks, including automated network operations; and

(F) digitally connect the supply chain network.

SEC. 4. DEVELOPMENT OF NATIONAL SMART MANUFACTURING PLAN.

(a) IN GENERAL.—Not later than 3 years after the date of enactment of this Act, the Secretary, in consulta-

tion with the National Academies, shall develop and complete a national plan for smart manufacturing technology development and deployment to improve the productivity and energy efficiency of the manufacturing sector of the United States.

(b) CONTENT.—

(1) IN GENERAL.—The plan developed under subsection (a) shall identify areas in which agency actions by the Secretary and other heads of relevant Federal agencies would—

(A) facilitate quicker development, deployment, and adoption of smart manufacturing technologies and processes;

(B) result in greater energy efficiency and lower environmental impacts for all American manufacturers; and

(C) enhance competitiveness and strengthen the manufacturing sectors of the United States.

(2) INCLUSIONS.—Agency actions identified under paragraph (1) shall include—

(A) an assessment of previous and current actions of the Department of Energy relating to smart manufacturing;

(B) the establishment of voluntary interconnection protocols and performance standards;

(C) the use of smart manufacturing to improve energy efficiency and reduce emissions in supply chains across multiple companies;

(D) actions to increase cybersecurity in smart manufacturing infrastructure;

(E) deployment of existing research results; and

(F) the leveraging of existing high-performance computing infrastructure.

(c) BIENNIAL REVISIONS.—Not later than 2 years after the date on which the Secretary completes the plan under subsection (a), and not less frequently than once every 2 years thereafter, the Secretary shall revise the plan to account for advancements in information and communication technology and manufacturing needs.

(d) REPORT.—Annually until the completion of the plan under subsection (a), the Secretary shall submit to Congress a report on the progress made in developing the plan.

(e) FUNDING.—The Secretary shall use unobligated funds of the Department of Energy to carry out this section.

SEC. 5. LEVERAGING EXISTING AGENCY PROGRAMS TO ASSIST SMALL AND MEDIUM MANUFACTURERS.

(a) FINDINGS.—Congress finds that—

(1) the Department of Energy has existing technical assistance programs that facilitate greater economic growth through outreach to and engagement with small and medium manufacturers;

(2) those technical assistance programs represent an important conduit for increasing the awareness of and providing education to small and medium manufacturers regarding the opportunities for implementing smart manufacturing; and

(3) those technical assistance programs help facilitate the implementation of best practices.

(b) EXPANSION OF TECHNICAL ASSISTANCE PROGRAMS.—The Secretary shall expand the scope of technologies covered by the Industrial Assessment Centers of the Department of Energy—

(1) to include smart manufacturing technologies and practices; and

(2) to equip the directors of the Industrial Assessment Centers with the training and tools necessary to provide technical assistance in smart manufacturing technologies and practices, including energy management systems, to manufacturers.

(c) FUNDING.—The Secretary shall use unobligated funds of the Department of Energy to carry out this section.

SEC. 6. LEVERAGING SMART MANUFACTURING INFRASTRUCTURE AT NATIONAL LABORATORIES.

(a) STUDY.—

(1) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Secretary shall conduct a study on how the Department of Energy can increase access to existing high-performance computing resources in the National Laboratories, particularly for small and medium manufacturers.

(2) INCLUSIONS.—In identifying ways to increase access to National Laboratories under paragraph (1), the Secretary shall—

(A) focus on increasing access to the computing facilities of the National Laboratories; and

(B) ensure that—

(i) the information from the manufacturer is protected; and

(ii) the security of the National Laboratory facility is maintained.

(3) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary shall submit to Congress a report describing the results of the study.

(b) ACTIONS FOR INCREASED ACCESS.—The Secretary shall facilitate access to the National Laboratories studied under subsection (a) for small and medium manufacturers so that small and medium manufacturers can fully use the high-performance computing resources of the National Laboratories to enhance the manufacturing competitiveness of the United States.

SEC. 7. STATE LEADERSHIP GRANTS.

(a) FINDING.—Congress finds that the States—

(1) are committed to promoting domestic manufacturing and supporting robust economic development activities; and

(2) are uniquely positioned to assist manufacturers, particularly small and medium manufacturers, with deployment of smart manufacturing through the provision of infrastructure, including—

(A) access to shared supercomputing facilities;

(B) assistance in developing process simulations; and

(C) conducting demonstrations of the benefits of smart manufacturing.

(b) GRANTS AUTHORIZED.—The Secretary may make grants on a competitive basis to States for establishing State programs to be used as models for supporting the implementation of smart manufacturing technologies.

(c) APPLICATION.—

(1) IN GENERAL.—To be eligible to receive a grant under this section, a State shall submit to the Secretary an application at such time, in such manner, and containing such information as the Secretary may require.

(2) CRITERIA.—The Secretary shall evaluate an application for a grant under this section on the basis of merit using criteria identified by the Secretary, including—

(A) the breadth of academic and private sector partners;

(B) alternate sources of funding;

(C) plans for dissemination of results; and

(D) the permanence of the infrastructure to be put in place by the project.

(d) REQUIREMENTS.—

(1) TERM.—The term of a grant under this section shall not exceed 3 years.

(2) MAXIMUM AMOUNT.—The amount of a grant under this section shall be not more than $3,000,000.

(3) MATCHING REQUIREMENT.—Each State that receives a grant under this section shall contribute matching funds in an amount equal to not less than 30 percent of the amount of the grant.

(e) USE OF FUNDS.—

(1) IN GENERAL.—A State shall use a grant provided under this section—

(A) to provide access to shared supercomputing facilities to small and medium manufacturers;

(B) to fund research and development of transformational manufacturing processes and materials technology that advance smart manufacturing; and

(C) to provide tools and training to small and medium manufacturers on how to adopt energy management systems and implement smart manufacturing technologies in the facilities of the small and medium manufacturers.

(f) EVALUATION.—The Secretary shall conduct biannual evaluations of each grant made under this section—

(1) to determine the impact and effectiveness of programs funded with the grant; and

(2) to provide guidance to States on ways to better execute the program of the State.

(g) FUNDING.—There is authorized to be appropriated to the Secretary to carry out this section $10,000,000 for each of fiscal years 2020 through 2023.

SEC. 8. REPORT.

The Secretary annually shall submit to Congress and make publicly available a report on the progress made in advancing smart manufacturing in the United States.

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