

117TH CONGRESS  
1ST SESSION

# S. 3120

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 provide assistance to small and medium manufacturers in implementing smart manufacturing programs, and for other purposes.

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IN THE SENATE OF THE UNITED STATES

OCTOBER 28, 2021

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

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## 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 provide assistance to small and medium manufacturers in implementing smart manufacturing programs, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Smart Manufacturing  
5 Leadership Act of 2021”.

1 **SEC. 2. FINDINGS.**

2 Congress finds that—

3 (1) the industrial sector—

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

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

8 (C) accounts for more than  
9 30,000,000,000,000,000 Btus of energy, a  
10 quantity that is equal to almost  $\frac{1}{3}$  of the en-  
11 ergy consumption of the United States;

12 (2) smart manufacturing is set to transform the  
13 manufacturing sector and the use by the manufac-  
14 turing sector of energy, water, raw materials, and  
15 labor over the 10 years following the date of enact-  
16 ment of this Act;

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

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

1           (5) the improvements in automation described  
2           in paragraph (4) are estimated to produce between  
3           \$5,000,000,000 and \$25,000,000,000 in energy sav-  
4           ings per year across the manufacturing sector for  
5           electricity alone by 2035;

6           (6) smart manufacturing technologies are esti-  
7           mated to add between \$10,000,000,000,000 and  
8           \$15,000,000,000,000 to the global gross domestic  
9           product over 20 years following the date of enact-  
10          ment of this Act;

11          (7) market barriers exist to the widespread  
12          adoption of smart manufacturing practices by all  
13          sizes of firms and to the investment in smart manu-  
14          facturing technologies, including lack of—

15                (A) common communication protocols be-  
16                tween smart manufacturing devices, which pre-  
17                vents interoperability, reduces system effi-  
18                ciencies, and stifles innovation;

19                (B) common standards for storing and  
20                sharing information relating to energy con-  
21                sumption and energy savings;

22                (C) an open-access smart manufacturing  
23                platform that enables the networking of busi-  
24                ness and automation systems of multiple ven-  
25                dors; and

1 (D) common cybersecurity protocols and  
2 standards;

3 (8) addressing the barriers described in para-  
4 graph (7) is in the interest of the United States;

5 (9) in response to the barriers described in  
6 paragraph (7), the Secretary is working with the pri-  
7 vate sector to reduce the market barriers through  
8 the development of voluntary protocols and stand-  
9 ards;

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

13 (A) improve the competitiveness of the do-  
14 mestic manufacturers; and

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

17 (11) Federal agency action can facilitate great-  
18 er economic growth through outreach and engage-  
19 ment in the smart manufacturing technology area;  
20 and

21 (12) the United States would benefit from a  
22 concerted and focused effort to advance the adoption  
23 of smart manufacturing throughout the manufac-  
24 turing sector of the United States.

1 **SEC. 3. DEFINITIONS.**

2 In this Act:

3 (1) ENERGY MANAGEMENT SYSTEM.—The term  
4 “energy management system” means a business  
5 management process based on standards of the  
6 American National Standards Institute that enables  
7 an organization to follow a systematic approach in  
8 achieving continual improvement of energy perform-  
9 ance, including energy efficiency, security, use, and  
10 consumption.

11 (2) INDUSTRIAL ASSESSMENT CENTER.—The  
12 term “Industrial Assessment Center” means a cen-  
13 ter located at an institution of higher education  
14 that—

15 (A) receives funding from the Department  
16 of Energy;

17 (B) provides an in-depth assessment of  
18 small and medium manufacturer plant sites to  
19 evaluate the facilities, services, and manufac-  
20 turing operations of the plant site; and

21 (C) identifies opportunities for potential  
22 savings for small- and medium-size manufac-  
23 turer plant sites from energy efficiency improve-  
24 ments, waste minimization, pollution preven-  
25 tion, and productivity improvement.

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

5           (4) NATIONAL LABORATORY.—The term “Na-  
6 tional Laboratory” has the meaning given the term  
7 in section 2 of the Energy Policy Act of 2005 (42  
8 U.S.C. 15801).

9           (5) NORTH AMERICAN INDUSTRY CLASSIFICA-  
10 TION SYSTEM.—The term “North American Indus-  
11 try Classification System” means the standard used  
12 by Federal statistical agencies in classifying business  
13 establishments for the purpose of collecting, ana-  
14 lyzing, and publishing statistical data relating to the  
15 business economy of the United States.

16           (6) SECRETARY.—The term “Secretary” means  
17 the Secretary of Energy.

18           (7) SMALL AND MEDIUM MANUFACTURER.—  
19 The term “small and medium manufacturer” means  
20 a manufacturing firm—

21                   (A) classified in the North American In-  
22 dustry Classification System as any of sectors  
23 31 through 33;

24                   (B) with gross annual sales of less than  
25 \$100,000,000;

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

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

5 (8) SMART MANUFACTURING.—The term  
6 “smart manufacturing” means advanced tech-  
7 nologies in information, automation, monitoring,  
8 computation, sensing, modeling, and networking  
9 that—

10 (A) digitally—

11 (i) simulate manufacturing production  
12 lines;

13 (ii) operate computer-controlled man-  
14 ufacturing equipment;

15 (iii) monitor and communicate pro-  
16 duction line status; and

17 (iv) manage and optimize energy pro-  
18 ductivity and cost throughout production;

19 (B) model, simulate, and optimize the en-  
20 ergy efficiency of a factory building;

21 (C) monitor and optimize building energy  
22 performance;

23 (D) model, simulate, and optimize the de-  
24 sign of energy efficient and sustainable prod-  
25 ucts, including the use of digital prototyping

1 and additive manufacturing to enhance product  
2 design;

3 (E) connect manufactured products in net-  
4 works to monitor and optimize the performance  
5 of the networks, including automated network  
6 operations; and

7 (F) digitally connect the supply chain net-  
8 work.

9 **SEC. 4. LEVERAGING EXISTING AGENCY PROGRAMS TO AS-**  
10 **SIST SMALL AND MEDIUM MANUFACTURERS.**

11 (a) FINDINGS.—Congress finds that—

12 (1) the Department of Energy has existing  
13 technical assistance programs that facilitate greater  
14 economic growth through outreach to and engage-  
15 ment with small and medium manufacturers;

16 (2) those technical assistance programs rep-  
17 resent an important conduit for increasing the  
18 awareness of and providing education to small and  
19 medium manufacturers regarding the opportunities  
20 for implementing smart manufacturing; and

21 (3) those technical assistance programs help fa-  
22 cilitate the implementation of best practices.

23 (b) EXPANSION OF TECHNICAL ASSISTANCE PRO-  
24 GRAMS.—The Secretary shall expand the scope of tech-



1 nologies covered by the Industrial Assessment Centers of  
2 the Department of Energy—

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

5 (2) to equip the directors of the Industrial As-  
6 sessment Centers with the training and tools nec-  
7 essary to provide technical assistance in smart man-  
8 ufacturing technologies and practices, including en-  
9 ergy management systems, to manufacturers.

10 (c) FUNDING.—The Secretary shall use unobligated  
11 funds of the Department of Energy to carry out this sec-  
12 tion.

13 **SEC. 5. LEVERAGING SMART MANUFACTURING INFRA-**  
14 **STRUCTURE AT NATIONAL LABORATORIES.**

15 (a) STUDY.—

16 (1) IN GENERAL.—Not later than 180 days  
17 after the date of enactment of this Act, the Sec-  
18 retary shall conduct a study on how the Department  
19 of Energy can increase access to existing high-per-  
20 formance computing resources in the National Lab-  
21 oratories, particularly for small and medium manu-  
22 facturers.

23 (2) INCLUSIONS.—In identifying ways to in-  
24 crease access to National Laboratories under para-  
25 graph (1), the Secretary shall—

1 (A) focus on increasing access to the com-  
2 puting facilities of the National Laboratories;  
3 and

4 (B) ensure that—

5 (i) the information from the manufac-  
6 turer is protected; and

7 (ii) the security of the National Lab-  
8 oratory facility is maintained.

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

13 (b) ACTIONS FOR INCREASED ACCESS.—The Sec-  
14 retary shall facilitate access to the National Laboratories  
15 studied under subsection (a) for small and medium manu-  
16 facturers so that small and medium manufacturers can  
17 fully use the high-performance computing resources of the  
18 National Laboratories to enhance the manufacturing com-  
19 petitiveness of the United States.

20 **SEC. 6. STATE LEADERSHIP GRANTS.**

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

22 (1) are committed to promoting domestic manu-  
23 facturing and supporting robust economic develop-  
24 ment activities; and

1           (2) are uniquely positioned to assist manufac-  
2           turers, particularly small and medium manufactur-  
3           ers, with deployment of smart manufacturing  
4           through the provision of infrastructure, including—

5                   (A) access to shared supercomputing facili-  
6           ties;

7                   (B) assistance in developing process sim-  
8           ulations; and

9                   (C) conducting demonstrations of the bene-  
10          fits of smart manufacturing.

11          (b) GRANTS AUTHORIZED.—The Secretary may  
12          make grants on a competitive basis to States for estab-  
13          lishing State programs to be used as models for sup-  
14          porting the implementation of smart manufacturing tech-  
15          nologies.

16          (c) APPLICATION.—

17                (1) IN GENERAL.—To be eligible to receive a  
18                grant under this section, a State shall submit to the  
19                Secretary an application at such time, in such man-  
20                ner, and containing such information as the Sec-  
21                retary may require.

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

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

3 (B) alternate sources of funding;

4 (C) plans for dissemination of results; and

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

7 (d) REQUIREMENTS.—

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

10 (2) MAXIMUM AMOUNT.—The amount of a  
11 grant under this section shall be not more than  
12 \$3,000,000.

13 (3) MATCHING REQUIREMENT.—Each State  
14 that receives a grant under this section shall con-  
15 tribute matching funds in an amount equal to not  
16 less than 30 percent of the amount of the grant.

17 (e) USE OF FUNDS.—

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

20 (A) to provide access to shared supercom-  
21 puting facilities to small and medium manufac-  
22 turers;

23 (B) to fund research and development of  
24 transformational manufacturing processes and

1 materials technology that advance smart manu-  
2 facturing; and

3 (C) to provide tools and training to small  
4 and medium manufacturers on how to adopt en-  
5 ergy management systems and implement smart  
6 manufacturing technologies in the facilities of  
7 the small and medium manufacturers.

8 (f) EVALUATION.—The Secretary shall conduct bian-  
9 nual evaluations of each grant made under this section—

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

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

14 (g) FUNDING.—There is authorized to be appro-  
15 priated to the Secretary to carry out this section  
16 \$10,000,000 for each of fiscal years 2022 through 2025.

17 **SEC. 7. REPORT.**

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

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