AMENDMENT NO._____ Calendar No._____

Purpose: To amend sections 3 through 114 of the bill, and for other purposes.

IN THE SENATE OF THE UNITED STATES—117th Cong., 1st Sess.

S. 1260

To establish a new Directorate for Technology and Innovation in the National Science Foundation, to establish a regional technology hub program, to require a strategy and report on economic security, science, research, innovation, manufacturing, and job creation, to establish a critical supply chain resiliency program, and for other purposes.

Referred to the Committee on _____ and ordered to be printed

Ordered to lie on the table and to be printed

AMENDMENTS intended to be proposed by

_____

Viz:

Strike sections 3 through 114 and insert the following:

SEC. 3. SENSE OF CONGRESS.

It is the sense of Congress that—

(1) the National Science Foundation, the Department of Energy and its National Laboratories (as defined in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801)), and other key Federal

agencies have carried out vital work supporting basic and applied research to create knowledge that is a key driver of the economy of the United States and a critical component of national security;

(2) openness to diverse perspectives and a focus on freedom from censorship and political bias will continue to make educational and research institutions in the United States beacons to thousands of students from across the world;

(3) increasing research and technology transfer investments, building regional capacity and reducing geographic disparity, strengthening supply chains, and increasing capabilities in key technology focus areas will enhance the competitive advantage and leadership of the United States in the global economy;

(4) the Federal Government must utilize the full talent and potential of the entire Nation by avoiding undue geographic concentration of research and education funding, encouraging broader participation of populations underrepresented in STEM, and collaborating with non-government partners to ensure the leadership of the United States in technological innovation; and

(5) authorization and funding for investments in research, education, technology transfer, intellectual property, manufacturing, and other core strengths of the United States innovation ecosystem, including at the National Science Foundation and the Department of Energy, should be done on a bipartisan basis.

SEC. 4. INTERAGENCY WORKING GROUP.

(a) ESTABLISHMENT.—The Director of the Office of Science and Technology Policy, acting through the National Science and Technology Council, shall establish or designate an interagency working group to coordinate the activities specified in subsection (c).

(b) COMPOSITION.—The interagency working group shall be composed of the following members (or their designees), who may be organized into subcommittees, as appropriate:

(1) The Secretary of Commerce.

(2) The Director of the National Science Foundation.

(3) The Secretary of Energy.

(4) The Secretary of Defense.

(5) The Director of the National Economic Council.

(6) The Director of the Office of Management and Budget.

(7) The Secretary of Health and Human Services.

(8) The Administrator of the National Aeronautics and Space Administration.

(9) The Secretary of Agriculture.

(10) The Director of National Intelligence.

(11) The Director of the Federal Bureau of Investigation.

(12) Such other Federal officials as the Director of the Office of Science and Technology Policy considers appropriate, including members of the National Science and Technology Council Committee on Technology.

(c) COORDINATION.—The interagency working group shall ensure that the activities of different Federal agencies enhance and complement, but, as appropriate, do not duplicate, efforts being carried out by another Federal agency, with a focus on—

(1) the activities of the National Science Foundation Technology and Innovation Directorate in the key technology focus areas, such as within the innovation centers under section 104 and test beds under section 108 under this Act;

(2) the activities of the Department of Commerce under this Act, including regional technology hubs under section 28 of the Stevenson-Wydler Act of 1980 (15 U.S.C. 13701 et seq.), the Manufacturing USA Program established under section 34(b)(1) of the National Institute of Standards and Technology Act (15 U.S.C. 278s(b)(1)), and the Hollings Manufacturing Extension Partnership;

(3) the activities of the Department of Energy in the key technology focus areas, including at the national laboratories, as defined in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801), and at Federal laboratories, as defined in section 4 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3703), and facilities and user facilities operated in partnership with such national laboratories or the Department of Energy; and

(4) any other program that the Director of the Office of Science and Technology Policy determines involves research and development with respect to the key technology focus areas.

(d) REPORT.—The interagency working group shall—

(1) by not later than 180 days after the date of enactment of this Act—

(A) conduct an initial review of Federal programs and resources with respect to the key technology focus areas identified pursuant to section 5(a), in order to—

(i) assess current level of efforts and characterize existing research infrastructure, as of the date of the review;

(ii) identify potential areas of overlap with respect to the key technology focus areas; and

(iii) identify potential cross-agency collaborations and joint funding opportunities;

(B) review whether Federal investments in the key technology focus areas have resulted in new domestic manufacturing capacity and job creation;

(C) submit a report regarding the review described in subparagraph (A) to Congress; and

(D) seek stakeholder input and recommendations in the course of such review; and

(2) shall carry out the annual reviews and updates required under section 5.

(e) DETAILED DESCRIPTION.—The National Science Foundation and the Department of Energy shall, in co-

ordination with the Office of Management and Budget, submit as part of their annual budget requests to Congress, a detailed description of the activities to be funded under this Act, including an explanation of how the requested funding is complementary and not redundant of programs, efforts, and infrastructure undertaken or supported by other relevant Federal agencies.

(f) CONFLICTS.—If any conflicts between Federal agencies arise while carrying out the activities under this section, the President shall make the final decision regarding resolution of the conflict.

SEC. 5. KEY TECHNOLOGY FOCUS AREAS.

(a) IN GENERAL.—

(1) INITIAL LIST.—The initial key technology focus areas are:

(A) Artificial intelligence, machine learning, autonomy, and related advances.

(B) High performance computing, semiconductors, and advanced computer hardware and software.

(C) Quantum information science and technology.

(D) Robotics, automation, and advanced manufacturing.

(E) Natural and anthropogenic disaster prevention or mitigation.

(F) Advanced communications technology and immersive technology.

(G) Biotechnology, medical technology, genomics, and synthetic biology.

(H) Cybersecurity, data storage, data management, and distributed ledger technologies.

(I) Advanced energy, batteries, and industrial efficiency, including advanced nuclear technologies for the purpose of electric generation (consistent with section 15 of the National Science Foundation Act of 1950 (42 U.S.C. 1874).

(J) Advanced materials science, including composites and 2D materials.

(2) REVIEW AND UPDATES.—The Director and the Secretary of Energy, in coordination with the interagency working group established under section 4 and in consultation with the Director of National Intelligence and the Director of the Federal Bureau of Investigation, shall annually review, and update as required, the list of key technology focus areas for purposes of this Act.

(b) ANNUAL REVIEW.—In annually reviewing and updating (as necessary) the list of key technology focus areas, the Director of the National Science Foundation and the Secretary of Energy, in coordination with the interagency working group established under section 4—

(1) shall consider input from relevant industries;

(2) may consider the challenges and recommendations identified in the report required by section 503 and in other relevant reports, such as technology and global trend reports from the defense and intelligence communities;

(3) shall consider the potential impact of the key technology focus areas on addressing national challenges, including competitive and security threats to the United States and to United States industries, including agriculture; and

(4) subject to the limitation under subsection (c), may add or delete key technology focus areas in light of shifting national needs or competitive threats to the United States (including for reasons of the United States or other countries having advanced or fallen behind in a technological area).

(c) LIMIT ON KEY TECHNOLOGY FOCUS AREAS.—Not more than 10 key technology focus areas shall be in-

cluded on the list of key technology focus areas at any time. Engineering and exploration relevant to the other key technology focus areas described in this section shall be considered part of the relevant key technology focus area.

(d) REPORTING.—The Director and the Secretary of Energy shall annually deliver a report to Congress detailing—

(1) the key technology focus areas and rationale for their selection;

(2) the role of the Foundation, the Department of Energy, and other Federal entities, as relevant, in advancing the key technology focus areas; and

(3) the impact, including to the academic research community, of any changes to the key technology focus areas.

(e) NATIONAL ACADEMIES.—Not later than 5 years after the date of enactment of this Act, the Director shall contract with the National Academies of Sciences, Engineering, and Medicine to conduct a review of the key technology focus areas.

TITLE I—NSF TECHNOLOGY AND INNOVATION

SEC. 101. DEFINITIONS.

In this title:

(1) DESIGNATED COUNTRY.—The term ''designated country'' means a country that has been approved and designated in writing by the President for purposes of this Act, after providing—

(A) not less than 30 days of advance notification and explanation to the relevant congressional committees before the designation; and

(B) in-person briefings to such committees, if requested during the 30-day advance notification period described in subparagraph (A).

(2) LABOR ORGANIZATION.—The term ''labor organization'' has the meaning given the term in section 2(5) of the National Labor Relations Act (29 U.S.C. 152(5)), except that such term shall also include—

(A) any organization composed of labor organizations, such as a labor union federation or a State or municipal labor body; and

(B) any organization which would be included in the definition for such term under such section 2(5) but for the fact that the organization represents—

(i) individuals employed by the United States, any wholly owned Government cor-

poration, any Federal Reserve Bank, or any State or political subdivision thereof;

(ii) individuals employed by persons subject to the Railway Labor Act (45 U.S.C. 151 et seq.); or

(iii) individuals employed as agricultural laborers.

(3) NATIONAL LABORATORY.—The term ''National Laboratory'' has the meaning given the term in section 3 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

(4) TRIBAL COLLEGE OR UNIVERSITY.—The term ''Tribal College or university'' has the meaning given the term in section 316(b)(3) of the Higher Education Act of 1965 (20 U.S.C. 1059c(b)(3)).

SEC. 102. DIRECTORATE ESTABLISHMENT AND PURPOSE.

(a) ESTABLISHMENT OF DIRECTORATE FOR TECHNOLOGY AND INNOVATION.—Subject to the availability of appropriations and not later than 180 days after the date of enactment of this Act, the Director shall establish a Directorate for Technology and Innovation in the Foundation.

(b) PURPOSES.—The Directorate shall further the following purposes:

(1) Strengthening the leadership of the United States in critical technologies, including as relevant to the critical national needs described in section 7018 of the America COMPETES Act (42 U.S.C. 1862o–5).

(2) Addressing and mitigating technology challenges integral to the geostrategic position of the United States through the activities authorized by this title.

(3) Enhancing the competitiveness of the United States by improving education in the key technology focus areas and attracting more students to such areas at all levels of education.

(4) Accelerating the translation and development of scientific advances in the key technology focus areas into processes and products in the United States.

(5) Utilizing the full potential of the United States workforce by avoiding undue geographic concentration of research and development and education funding across the United States, and encouraging broader participation in the key technology focus areas by populations underrepresented in STEM.

(6) Ensuring the programmatic work of the Directorate and Foundation incorporates a workforce perspective from labor organizations and workforce training organizations.

(c) ACTIVITIES.—The Directorate—

(1) shall support basic and applied research, and technology development of such research, including through awards to individual researchers, entities, or consortia and through diverse funding mechanisms and models;

(2) shall identify and develop opportunities to coordinate and collaborate on research, development, and commercialization—

(A) with other directorates and offices of the Foundation;

(B) with stakeholders in academia, the private sector, and nonprofit entities; and

(C) with other Federal research agencies, as well as State and local governments;

(3) shall provide awards for research and development projects designed to achieve specific technology metrics or objectives;

(4) may support research and technology development infrastructure, including testbeds, to ad-

vance the development, operation, integration, and deployment of innovation;

(5) shall identify and develop opportunities to reduce barriers for technology transfer, including intellectual property frameworks between academia and industry, nonprofit entities, and the venture capital communities;

(6) shall build capacity for research at institutions of higher education across the United States;

(7) shall partner with other directorates and offices of the Foundation for projects or research, including—

(A) to pursue basic questions about natural, human, and physical phenomena that could enable advances in the key technology focus areas;

(B) to study questions that could affect the design (including human interfaces), operation, deployment, or the social and ethical consequences of technologies in the key technology focus areas, including the development of technologies that complement or enhance the abilities of workers and impact of specific innovations on domestic jobs and equitable opportunity; and

(C) to further the creation of a domestic workforce capable of advancing, using, and adapting to key technology focus areas and understanding and improving the impact of key technology focus areas on STEM teaching and learning by advancing the key technology focus areas, including engaging relevant partners in research and innovation programs;

(8) may make awards under the SBIR and STTR programs (as defined in section 9(e) of the Small Business Act (15 U.S.C. 638(e)); and

(9) may enter into and perform such contracts, make such financial assistance awards, carry out such other transactions, or make such other arrangements, or modifications thereof, as may be necessary in the conduct of the work of the Directorate and on such terms as the Director considers appropriate, in furtherance of the purposes of this title.

(d) ASSISTANT DIRECTOR.—

(1) APPOINTMENT.—The Director shall appoint an Assistant Director for the Directorate, in the same manner as other Assistant Directors of the Foundation are appointed.

(2) QUALIFICATIONS.—Each Assistant Director for the Directorate shall be an individual, who by

reason of professional background and experience, is specially qualified to advise the Foundation on all matters pertaining to research, development, and commercialization at the Foundation, including partnerships with the private sector and other users of Foundation funded research.

(e) CONSIDERATIONS.—After completion of the studies regarding emerging technologies conducted by the Secretary of Commerce under title XV of division FF of the Consolidated Appropriations Act, 2021 (Public Law 116-260), the Director shall consider the results of such studies in carrying out the activities of the Directorate.

SEC. 103. PERSONNEL MANAGEMENT.

(a) PERSONNEL.—The Director shall establish and maintain within the Directorate a staff with sufficient qualifications and expertise to enable the Directorate to carry out its responsibilities under this title.

(b) PROGRAM DIRECTORS.—

(1) DESIGNATION.—The Director may designate employees to serve as program directors for the programs established within the Directorate pursuant to the responsibilities established under paragraph (2). The Director shall ensure that program directors—

(A) have expertise in the key technology focus areas; and

(B) come from a variety of backgrounds, including industry, and from a variety of institutions of higher education.

(2) RESPONSIBILITIES.—A program director of a program of the Directorate shall be responsible for—

(A) establishing research and development goals for the program, including through the convening of workshops and conferring with outside experts and by publicizing the goals of the program to the public and private sectors;

(B) soliciting proposals from entities to conduct research in areas of particular promise within key technology focus areas, especially areas that the private sector or the Federal Government are not likely to undertake alone;

(C) identifying areas for research and development;

(D) building research collaborations for carrying out the program;

(E) reviewing applications for projects to be supported under the program, and considering—

(i) the novelty and scientific and technical merit of the proposed projects;

(ii) broader impacts criteria under section 526 of the National Science Foundation Authorization Act of 2010 (42 U.S.C. 1862p–14);

(iii) the demonstrated capabilities of the applicants to successfully carry out the proposed project;

(iv) the consideration by the applicant of future commercial applications of the project, including the feasibility of partnering with 1 or more commercial entities; and

(v) such other criteria as are established by the Director; and

(F) monitoring the progress of projects supported under the program and recommending program restructure or termination, as needed.

(3) TERMS.—Program directors of the Directorate may be appointed by the Director for a limited term, renewable at the discretion of the Director.

(c) SELECTION CRITERIA AND REPORT.—

(1) PEER REVIEW.—The Directorate may use a peer review process to inform the selection of award recipients.

(2) REPORT.—Not later than 18 months after the establishment of the Directorate, the Director shall prepare and submit a report to Congress regarding the use of alternative methods for the selection of award recipients and the distribution of funding to recipients, as compared to the traditional peer review process.

(d) RULE OF CONSTRUCTION.—Nothing in this section shall be construed to modify the authority of the Director or the National Science Board with respect to the selection of recipients for funding from the Foundation.

SEC. 104. INNOVATION CENTERS.

(a) UNIVERSITY TECHNOLOGY CENTER PROGRAM.—

(1) IN GENERAL.—From amounts made available to the Directorate, the Director shall establish a program in the Directorate to make awards, through a competitive selection process, to eligible entities to establish university technology centers.

(2) PURPOSE.—The purpose of the university technology centers shall be to—

(A) conduct multi-disciplinary, collaborative basic and applied research, relevant to at least one of the key technology focus areas;

(B) leverage the expertise of multi-disciplinary and multi-sector partners, including partners from private industry;

(C) further the development, deployment, and commercialization of innovations, including inventions, in the key technology focus areas, including those derived from the activities of the university technology center; and

(D) support the development of scientific, innovation, entrepreneurial, and educational capacity within the region of the university technology center.

(3) USE OF FUNDS.—University technology centers established under this subsection may use support provided—

(A) to carry out research to advance innovation in the key technology focus areas;

(B) for technology development activities such as proof-of-concept development, prototyping, design modification, experimental development, and other actions to reduce the cost,

time, and risk of commercializing new technologies;

(C) for the costs of equipment and cyberinfrastructure;

(D) for the costs associated with technology transfer and commercialization, including patenting and licensing; or

(E) for operations and staff.

(4) SELECTION PROCESS.—In selecting recipients under this subsection, the Director shall consider, in addition to the scientific and technical merit of the proposal—

(A) maximizing regional and geographic diversity of the university technology centers;

(B) the extent to which the applicant's proposal would broaden participation by populations underrepresented in STEM;

(C) the capacity of the applicant to engage industry, labor, and other appropriate organizations and, where applicable, contribute to growth in domestic manufacturing capacity and job creation;

(D) in the case of a consortium, the extent to which the proposal includes institutions listed in paragraph (7)(C)(ii);

(E) the amount of funds from industry organizations described in paragraph (5)(A)(ii) the applicant would use towards establishing the university technology center;

(F) the plan and capability of the applicant to take measures to prevent the inappropriate use of the research and technology of the center, including research results, data, and intellectual property, as appropriate and consistent with the requirements of the relevant award; and

(G) the plan and capability of the applicant to support proof-of-concept development and prototyping as well as technology transfer and commercialization activities.

(5) REQUIREMENTS.—

(A) IN GENERAL.—The Director shall ensure that any eligible entity receiving an award under this subsection has—

(i) the capacity or the ability to acquire the capacity to advance the purposes described in section 102(b); and

(ii) secured contributions for establishing the university technology center under this subsection from industry or

other non-Federal organizations in an amount not less than 10 percent of the total amount of the award the eligible entity would receive under this subsection.

(B) CONSORTIUM ELIGIBILITY.—To be eligible to receive an award for the establishment and operation of a university technology center, a consortium shall be composed of not fewer than 2 entities as described in paragraph (7)(C) and operate subject to a binding agreement, entered into by each member of the consortium, that documents—

(i) the proposed partnership agreement, including the governance and management structure of the university technology center;

(ii) measures the consortium will undertake to enable cost-effective implementation of activities under paragraph (3);

(iii) a proposed budget, including financial contributions from non-Federal sources; and

(iv) the plan for ownership and use of any intellectual property developed by the center.

(6) SUPPORT OF REGIONAL TECHNOLOGY HUBS.—Each university technology center established under this subsection may support and participate in, as appropriate, the activities of any regional technology hub designated under section 28 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.), as amended by section 401 of this Act.

(7) ELIGIBLE ENTITY.—In this subsection, the term ''eligible entity'' means—

(A) an individual institution of higher education;

(B) a nonprofit entity; or

(C) a consortium that—

(i) shall include and be led by an institution of higher education or by a nonprofit entity, designed to support technology development;

(ii) shall include 1 or more institution that is—

(I) a historically Black college or university;

(II) a Tribal College or University;

(III) a minority-serving institution;

(IV) an institution that participates in the Established Program to Stimulate Competitive Research under section 113 of the National Science Foundation Authorization Act of 1988 (42 U.S.C. 1862g);

(V) an emerging research institution; or

(VI) a community college; and

(iii) may include 1 or more—

(I) additional entities described in subparagraph (A) or (B);

(II) industry entities, including startups, small businesses, and public-private partnerships;

(III) economic development organizations or venture development organizations, as such term are defined in section 28(a) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 13701 et seq.), as amended by section 401 of this Act;

(IV) National Laboratories;

(V) Federal laboratories, as defined in section 4 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3703);

(VI) Federal research facilities;

(VII) labor organizations;

(VIII) entities described in subparagraph (A) or (B) from allied or partner countries;

(IX) other entities if determined by the Director to be vital to the success of the program; and

(X) binational research and development foundations and funds, excluding foreign entities of concern, as defined in section 307.

(b) INNOVATION INSTITUTE.—

(1) IN GENERAL.—The Director shall establish innovation institutes to further the research, development, and commercialization of innovation in the key technology focus areas.

(2) PARTNERSHIPS.—

(A) IN GENERAL.—Each innovation institute shall be comprised of a partnership including 2 or more of the following entities:

(i) An institution of higher education.

(ii) A for-profit company.

(iii) A nonprofit organization.

(iv) A Federal agency.

(v) Another entity, if that entity is determined by the Director to be vital to the success of the program.

(B) CO-EQUAL.—Each entity comprising the institute shall, to the extent practicable, work as co-equal partners in terms of funding and research efforts in support of the institute.

(C) INSTITUTIONAL OR ORGANIZATIONAL LEVEL.—The Director shall work to ensure that such partnerships exist at the institutional or organization level, rather than solely at the principal investigator level.

(3) COST SHARE.—To the extent practicable, not less than half of the funding for an institute shall be provided by non-Federal entities.

(c) NUMBER OF CENTERS AND INSTITUTES ESTABLISHED.—The Director shall endeavor to establish a balance in the number of university technology centers and innovation institutes.

SEC. 105. TRANSITION OF NSF PROGRAMS.

The Director may transition the management of existing programs of the National Science Foundation that conduct activities in addition to basic research to the Directorate, including—

(1) Convergence Accelerator;

(2) Industry-University Cooperative Research Centers;

(3) National AI Research Institutes;

(4) Innovation Corps (I-Corps), as described in section 601 of the American Innovation and Competitiveness Act (42 U.S.C. 1862s-8); and

(5) any other programs that the Director considers appropriate.

SEC. 106. PROVIDING SCHOLARSHIPS, FELLOWSHIPS, AND OTHER STUDENT SUPPORT.

(a) IN GENERAL.—The Director, acting through the Directorate, shall fund undergraduate scholarships (including at community colleges), graduate fellowships and traineeships, and postdoctoral awards in the key technology focus areas.

(b) IMPLEMENTATION.—The Director may carry out subsection (a) by making awards—

(1) directly to students; and

(2) to institutions of higher education or consortia of institutions of higher education, including

those institutions or consortia involved in operating university technology centers established under section 104(a).

(c) BROADENING PARTICIPATION.—In carrying out this section, the Director shall take steps to increase the participation of populations that are underrepresented in STEM, which may include—

(1) establishing or augmenting programs targeted at populations that are underrepresented in STEM;

(2) supporting traineeships or other relevant programs at minority-serving institutions;

(3) addressing current and expected gaps in the availability or skills of the STEM workforce, or addressing needs of the STEM workforce, including by increasing educational capacity at institutions and by prioritizing awards to United States citizens, permanent residents, and individuals that will grow the domestic workforce; and

(4) addressing geographic diversity in the STEM workforce.

(d) INNOVATION.—In carrying out this section, the Director shall encourage innovation in graduate education, including through encouraging institutions of higher education to offer graduate students opportunities to gain ex-

perience in industry or Government as part of their graduate training, and through support for students in professional masters programs related to the key technology focus areas.

(e) AREAS OF FUNDING SUPPORT.—Subject to the availability of funds to carry out this section, the Director shall—

(1) issue—

(A) postdoctoral awards,

(B) graduate fellowships and traineeships, inclusive of the NSF Research Traineeships and fellowships awarded under the Graduate Research Fellowship Program; and

(C) scholarships, including undergraduate scholarships, research experiences, and internships, including—

(i) scholarships to attend community colleges; and

(ii) research experiences and internships under sections 513, 514, and 515 of the America COMPETES Reauthorization Act of 2010 (42 U.S.C. 1862p–5; 1862p–6; 1862p–7);

(2) ensure that not less than 10 percent of the funds made available to carry out this section are

used to support additional awards that focus on community college training, education, and teaching programs that increase the participation of populations that are underrepresented in STEM, including technical programs through programs such as the Advanced Technological Education program;

(3) ensure that not less than 20 percent of the funds made available to carry out this section are used to support institutions of higher education, and other institutions, located in jurisdictions that participate in the program under section 113 of the National Science Foundation Authorization Act of 1988 (42 U.S.C. 1862g); and

(4) if funds remain after carrying out paragraphs (1), (2), and (3), make awards to institutions of higher education to enable the institutions to fund the development and establishment of new or specialized programs of study for graduate, undergraduate, or technical college students and the evaluation of the effectiveness of those programs of study.

(f) EXISTING PROGRAMS.—The Director may use or augment existing STEM education programs of the Foundation and leverage education or entrepreneurial partners to carry out this section.

SEC. 107. RESEARCH AND DEVELOPMENT.

(a) IN GENERAL.—From amounts made available for the Directorate, the Director shall make awards, on a competitive basis, for research and technology development within the key technology focus areas.

(b) PURPOSE.—The purpose of the awards under this section shall be to demonstrate revolutionary technological advances in the key technology focus areas, including advances that expedite short-term technology deployment.

(c) RECIPIENTS.—Recipients of funds under this section may include institutions of higher education, research institutions, nonprofit entities, private sector entities, consortia, or other entities as defined by the Director.

(d) METRICS.—The Director may set metrics, including goals and deadlines, for development of such technology as determined in the terms of the award, and may use such metrics to determine whether an award recipient shall be eligible for continued or follow-on funding.

(e) SELECTION CRITERIA.—In selecting recipients for an award under this section, the Director shall consider, at a minimum—

(1) the relevance of the project to the key technology focus areas;

(2) the current status of the technology, the limits of current practice, and the likelihood of the

private sector to independently demonstrate a similar technological advance;

(3) the potential of the project to generate a revolutionary technological advance, including advances that can expedite short-term technology deployment;

(4) the potential impact of the project on the economic security, national security, or technological competitiveness of the United States;

(5) the likelihood of the project's success;

(6) the cost and time associated with the project;

(7) the appropriateness of quantitative goals and metrics for evaluating the project and a plan for evaluating those metrics; and

(8) the path for developing and, as appropriate commercializing, the technology.

SEC. 108. TEST BEDS.

(a) PROGRAM AUTHORIZED.—

(1) IN GENERAL.—From amounts made available for the Directorate, the Director, in coordination with the Director of the National Institute of Standards and Technology and other Federal agencies, as determined appropriate by the Director, shall establish a program in the Directorate to make

awards, on a competitive basis, to institutions of higher education, nonprofit organizations, or consortia (as defined in section 104(a)(7)(C)) to establish and operate test beds, which may include fabrication facilities and cyberinfrastructure, to advance the development, operation, integration, deployment, and, as appropriate, demonstration of new, innovative technologies in the key technology focus areas, which may include hardware or software.

(2) COORDINATION.—In establishing new test beds under this section, the Director shall ensure coordination with other test beds supported by the Foundation or other Federal agencies to avoid duplication and maximize the use of Federal resources.

(b) PROPOSALS.—An applicant for an award under this section shall submit a proposal to the Director, at such time, in such manner, and containing such information as the Director may reasonably require. The proposal shall, at a minimum, describe—

(1)(A) the technology or technologies that will be the focus of the test bed; and

(B) the goals of the work to be done at the test bed;

(2) how the applicant will assemble a workforce with the skills needed to operate the test bed;

(3) how the applicant will ensure broad access to the test bed;

(4) how the applicant will collaborate with firms in the key technology focus areas, including through coordinated research and development and funding, to ensure that work in the test bed will contribute to the commercial viability of any technologies and will include collaboration from industry and labor organizations;

(5) how the applicant will encourage the participation of inventors and entrepreneurs and the development of new businesses;

(6) how the applicant will increase participation by populations that are underrepresented in STEM;

(7) how the applicant will demonstrate that the commercial viability of any new technologies will support the creation of high-quality domestic jobs;

(8) how the test bed will operate after Federal funding has ended;

(9) how the test bed will disseminate lessons and other technical information to United States entities or allied or partner country entities in the United States; and

(10) how the applicant plans to take measures to prevent the inappropriate use of research results,

data, and intellectual property, as applicable and consistent with the requirements of the award.

(c) AUTHORIZED USE OF FUNDS.—A recipient of an award under this section may, in order to achieve the purposes described in subsection (a), use the award for the purchase of equipment and for the support of students, faculty and staff, and postdoctoral researchers.

(d) PRIORITY.—In selecting award recipients under this section, the Director shall give priority to applicants with proposals that maximize the geographic diversity of test beds.

(e) INTERAGENCY ANNUAL MEETINGS.—The Director, the Secretary of Commerce, and the heads of other Federal departments and agencies, or their designees, with test bed related equities shall hold an annual meeting to coordinate their respective test bed related investments, future plans, and other appropriate matters, to avoid conflicts and duplication of efforts. Upon request by Congress, Congress shall be briefed on the results of the meetings.

SEC. 109. ACADEMIC TECHNOLOGY TRANSFER.

(a) IN GENERAL.—From amounts made available to the Directorate, the Director, in coordination with the Director of the National Institute of Standards and Technology and other Federal agencies as determined appro-

priate by the Director, shall make awards, on a competitive basis, to eligible entities to advance the development and commercialization of technologies, particularly those in the key technology focus areas.

(b) ELIGIBLE ENTITIES.—To be eligible to receive an award under this section, an entity shall be—

(1) an institution of higher education, which may be a community college;

(2) a nonprofit entity that is either affiliated with an institution of higher education or designed to support technology development or entrepreneurship; or

(3) a consortium that includes—

(A) an entity described in paragraph (1) or (2) as the lead award recipient; and

(B) one or more additional individuals or entities, which shall be—

(i) an economic development organization or similar entity that is focused primarily on improving science, technology, innovation, or entrepreneurship;

(ii) an industry organization or firm in a relevant technology or innovation sector;

(iii) an industry-experienced executive with entrepreneurship experience that is focused primarily on de-risking technologies from both a scientific and a business perspective; or

(iv) an individual or entity with industry- and startup- experienced business expertise, including a mentor network, across relevant technology or innovation sectors.

(c) PROPOSALS.—An eligible entity desiring an award under this section shall submit a proposal to the Director at such time, in such manner, and containing such information as the Director may require. The proposal shall include, at a minimum, a description of—

(1) the steps the applicant will take to enable technology transfer and to reduce the risks for commercialization for new technologies and why such steps are likely to be effective;

(2) how the applicant will encourage the training and participation of students and potential entrepreneurs and the transition of research results to practice, including the development of new businesses;

(3) as relevant, potential steps to drive economic growth in a particular region, by collaborating with industry, venture capital entities, nonprofit entities, and State and local governments within that region; and

(4) background information that the Director determines is relevant to demonstrate the success of the innovation and entrepreneurship support models proposed by the applicant to commercialize technologies.

(d) ACADEMIC TECHNOLOGY TRANSFER ENHANCEMENT PROGRAM.—

(1) IN GENERAL.—The Director, in coordination with the Director of the National Institute of Standards and Technology, shall make awards, on a competitive basis, to support eligible entities in building sustainable technology transfer capacity.

(2) USE OF FUNDS.—An eligible entity that receives an award under this subsection shall use award funds to carry out one or more of the following:

(A) Identifying academic research with the potential for technology transfer and commercialization, particularly as relevant to the key technology focus areas.

(B) Providing training and support to scientists, engineers, and inventors on technology transfer, commercialization, and research protection.

(C) Offsetting the costs of patenting and licensing research products, both domestically and internationally.

(D) Revising institution policies, including policies related to intellectual property and faculty entrepreneurship, and taking other necessary steps to implement relevant best practices for academic technology transfer.

(E) Ensuring the availability of staff, including technology transfer professionals, entrepreneurs in residence, and other mentors as required to accomplish the purpose of this subsection.

(F) Identifying and facilitating relationships among local and national business leaders, including investors, and potential entrepreneurs to encourage successful commercialization.

(G) Creating and funding competitions to allow entrepreneurial ideas to illustrate their commercialization potential, including through

venture funds of institutions of higher education.

(H) Creating or supporting entities that could enable researchers to further develop new technology, through capital investment, advice, staff support, or other means.

(I) Building technology transfer capacity at institutions of higher education.

(3) LIMITATIONS ON FUNDING.—In awarding funding under this subsection, the Director shall—

(A) award not more than $1,000,000 per fiscal year to an eligible entity;

(B) in determining the duration of funding, endeavor to ensure the creation of sustainable technology transfer practices at the eligible entity; and

(C) ensure that grants under this subsection shall not support the development or operation of capital investment funds.

(e) COLLABORATIVE INNOVATION RESOURCE CENTER PROGRAM.—

(1) IN GENERAL.—The Director shall make awards under this subsection to eligible entities to establish collaborative innovation resource centers that promote regional technology transfer and tech-

nology development activities available to more than one institution of higher education and to other entities in a region.

(2) COLLABORATION PRIORITY.—In making awards under this subsection, the Director shall give priority to eligible entities that are consortia described in subsection (b)(3) and that have a cost share, which may include an in-kind cost share, from members of a consortium, at levels as required by the Director.

(3) USE OF FUNDS.—An eligible entity that receives an award under this subsection shall use award funds to carry out one or more of the following activities, to the benefit of the region in which the center is located:

(A) Providing start-ups and small business concerns (as defined in section 3 of the Small Business Act (15 U.S.C. 632)) within the region with access to facilities, scientific infrastructure, personnel, and other assets as required for technology maturation.

(B) Supporting entrepreneurial training for start-up and small business personnel.

(C) Providing engineering and entrepreneurial experiences and hands-on training for

students enrolled in participating institutions of higher education.

(f) REPORTING ON COMMERCIALIZATION BASED ON METRICS.—The Director shall establish—

(1) metrics related to commercialization for an award under this section; and

(2) a reporting schedule for recipients of such awards that takes into account both short- and long-term goals of the programs under this section.

(g) GEOGRAPHIC DIVERSITY.—The Director shall ensure regional and geographic diversity in issuing awards under this section.

(h) SUPPLEMENT NOT SUPPLANT.—The Director shall ensure that funds made available under this section shall be used to create additional support for technology transfer activities at eligible entities. For the duration of the awards, recipients shall be required to maintain funding for such activities at similar levels as the funding for those activities for the 2 fiscal years preceding the award.

SEC. 110. CAPACITY-BUILDING PROGRAM FOR DEVELOPING UNIVERSITIES.

(a) IN GENERAL.—The Director shall establish a program in the Directorate to make awards, on a competitive basis, to eligible institutions described in subsection (b)

to support the mission of the Directorate and to build institutional research capacity at such eligible institutions.

(b) EMERGING INSTITUTION.—To be eligible to receive an award under this section, an institution shall be a historically Black college or university or a minority-serving institution, with not more than $50,000,000 in annual federally-financed research and development expenditures for science and engineering as reported through the National Science Foundation Higher Education Research and Development Survey.

(c) PROPOSALS.—To receive an award under this section, an eligible institution shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require, including a plan that describes how the eligible institution will establish or expand research office capacity and how such award would be used to—

(1) conduct an assessment of capacity-building and research infrastructure needs of the eligible institution;

(2) enhance institutional resources to provide administrative research development support to faculty at the eligible institution;

(3) bolster institutional research competitiveness to support grants awarded by the Directorate;

(4) support the acquisition of instrumentation necessary to build research capacity in research areas directly associated with the Directorate;

(5) increase capability of the eligible institution to move technology into the marketplace;

(6) increase engagement with industry to execute research through the SBIR and STTR programs (as defined in section 9(e) of the Small Business Act (15 U.S.C. 638(e)) and direct contracts;

(7) provide student engagement and research training opportunities at the undergraduate, graduate, and postdoctoral levels at the eligible institution;

(8) further faculty development initiatives and strengthen institutional research training infrastructure, capacity, and competitiveness; or

(9) address plans and prospects for long-term sustainability of institutional enhancements resulting from the award including, if applicable, how the award may be leveraged by the eligible institution to build a broader base of support.

(d) AWARDS.—Awards made under this section shall be for periods of 3 years, and may be extended for periods of not more than 5 years.

(e) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section $150,000,000 for each of fiscal years 2022 through 2026.

SEC. 111. TECHNICAL ASSISTANCE.

The Director may—

(1) coordinate with other Federal agencies to establish interagency and multidisciplinary teams to provide technical assistance to recipients of, and prospective applicants for, awards under this title;

(2) by Federal interagency agreement and notwithstanding any other provision of law, transfer funds available to carry out this title to the head of another Federal agency to facilitate and support the provision of such technical assistance; and

(3) enter into contracts with third parties to provide such technical assistance.

SEC. 112. COORDINATION OF ACTIVITIES.

(a) IN GENERAL.—In carrying out the activities of the Directorate, the Director and the heads of other Federal research agencies, as appropriate, shall work cooperatively to further the goals of this title in the key technology focus areas.

(b) COORDINATION WITH NIST AND DEPARTMENT OF ENERGY.—The Director shall, as appropriate, work in coordination with—

(1) the Director of the National Institute of Standards and Technology; and

(2) the Secretary of Energy.

(c) AVOID DUPLICATION.—The Director shall ensure, to the greatest extent appropriate, that activities carried out by the Directorate are not duplicative of activities supported by other parts of the Foundation or other relevant Federal agencies. In carrying out the activities prescribed by this Act, the Director and heads of other Federal research agencies shall cooperate to avoid duplication of effort and to ensure the responsible stewardship of funds.

(d) COMPTROLLER GENERAL REPORT.—Not later than 3 years after the date of enactment of this Act, the Comptroller General of the United States shall prepare and submit a report to Congress, and shall simultaneously submit the report to the Director and the Director of the Office of Science and Technology Policy, describing the interagency cooperation that occurred during the preceding years pursuant to this section, including a list of—

(1) any funds provided from the Directorate to other directorates and offices of the Foundation; and

(2) any instances in which unnecessary duplication of effort may have occurred.

SEC. 113. REPORTING REQUIREMENTS.

(a) REPORTS.—Not later than 1 year after the date of enactment of this Act and annually thereafter, the Director, in coordination with the heads of relevant Federal agencies, shall prepare and submit to Congress—

(1) a strategic vision and spending plan for the next 5 years for the Directorate, including a description of how the Foundation will increase funding for research and education for populations underrepresented in STEM and geographic areas;

(2) in coordination with the Secretary of State, a description of any funds the Foundation may plan to receive from—

(A) entities other than institutions of higher education; and

(B) certain designated countries; and

(3) a description of the planned activities of the Directorate to secure federally funded science and technology pursuant to section 1746 of the National Defense Authorization Act for Fiscal Year 2020 (Public Law 116–92; 42 U.S.C. 6601 note) and section 223 of William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 (Public Law 116–283) and the requirements under title III.

(b) ANNUAL BRIEFING.—Each year, the Director shall formally request a briefing from the Secretary of Defense, the Secretary of Commerce, the Director of the Federal Bureau of Investigation, the Director of National Intelligence, and as appropriate the heads of other Federal agencies regarding their efforts to preserve the United States' advantages generated by the activity of the Directorate.

(c) PROVIDING AUTHORITY TO DISSEMINATE INFORMATION.—Section 11 of the National Science Foundation Act of 1950 (42 U.S.C. 1870) is amended—

(1) in subsection (j), by striking ''and'' after the semicolon;

(2) in subsection (k), by striking the period at the end and inserting ''; and''; and

(3) by adding at the end the following:

''(l) to provide for the widest practicable and appropriate dissemination of information within the United States concerning the Foundation's activities and the results of those activities.''.

SEC. 114. AUTHORIZATION OF APPROPRIATIONS FOR THE FOUNDATION.

(a) FISCAL YEAR 2022.—

(1) FOUNDATION.—There is authorized to be appropriated to the Foundation $10,800,000,000 for fiscal year 2022.

(2) SPECIFIC NSF ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) $9,000,000,000 shall be made available to carry out the activities of the Foundation outside of the Directorate, of which $800,000,000 shall be for STEM education and related activities, including workforce activities under section 202; and

(B) $1,800,000,000 shall be made available to the Directorate, of which—

(i) $594,000,000 shall be for the innovation centers under section 104;

(ii) $324,000,000 shall be for scholarships, fellowships, and other activities under section 106;

(iii) $252,000,000 shall be for academic technology transfer under section 109;

(iv) $180,000,000 shall be for test beds under section 108;

(v) $270,000,000 shall be for research and development activities under section 107; and

(vi) an amount equal to 10 percent of the total made available to the Directorate under this subparagraph shall be transferred to the Foundation for collaboration with directorates and offices of the Foundation outside of the Directorate as described under section 102(c)(7).

(b) FISCAL YEAR 2023.—

(1) FOUNDATION.—There is authorized to be appropriated to the Foundation $12,800,000,000 for fiscal year 2023.

(2) SPECIFIC NSF ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) $9,600,000,000 shall be made available to carry out the activities of the Foundation outside of the Directorate, of which $1,190,000,000 shall be for STEM education and related activities, including workforce activities under section 202; and

(B) $3,200,000,000 shall be made available to the Directorate, of which—

(i) $1,056,000,000 shall be for the innovation centers under section 104;

(ii) $576,000,000 shall be for scholarships, fellowships, and other activities under section 106;

(iii) $448,000,000 shall be for academic technology transfer under section 109;

(iv) $320,000,000 shall be for test beds under section 108;

(v) $480,000,000 shall be for research and development activities under section 107; and

(vi) an amount equal to 10 percent of the total made available to the Directorate under this subparagraph shall be transferred to the Foundation for collaboration with directorates and offices of the Foundation outside of the Directorate as described under section 102(c)(7).

(c) FISCAL YEAR 2024.—

(1) FOUNDATION.—There is authorized to be appropriated to the Foundation $16,600,000,000 for fiscal year 2024.

(2) SPECIFIC NSF ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) $10,300,000,000 shall be made available to carry out the activities of the Foundation outside of the Directorate, of which $1,600,000,000 shall be for STEM education and related activities, including workforce activities under section 202; and

(B) $6,300,000,000 shall be made available to the Directorate, of which—

(i) $2,079,000,000 shall be for the innovation centers under section 104;

(ii) $1,134,000,000 shall be for scholarships, fellowships, and other activities under section 106;

(iii) $882,000,000 shall be for academic technology transfer under section 109;

(iv) $630,000,000 shall be for test beds under section 108;

(v) $945,000,000 shall be for research and development activities under section 107; and

(vi) an amount equal to 10 percent of the total made available to the Directorate

under this subparagraph shall be transferred to the Foundation for collaboration with directorates and offices of the Foundation outside of the Directorate as described under section 102(c)(7).

(d) FISCAL YEAR 2025.—

(1) FOUNDATION.—There is authorized to be appropriated to the Foundation $19,500,000,000 for fiscal year 2025.

(2) SPECIFIC NSF ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) $11,100,000,000 shall be made available to carry out the activities of the Foundation outside of the Directorate, of which $2,100,000,000 shall be for STEM education and related activities, including workforce activities under section 202; and

(B) $8,400,000,000 shall be made available to the Directorate, of which—

(i) $2,772,000,000 shall be for the innovation centers under section 104;

(ii) $1,512,000,000 shall be for scholarships, fellowships, and other activities under section 106;

(iii) $1,176,000,000 shall be for academic technology transfer under section 109;

(iv) $840,000,000 shall be for test beds under section 108;

(v) $1,260,000,000 shall be for research and development activities under section 107; and

(vi) an amount equal to 10 percent of the total made available to the Directorate under this subparagraph shall be transferred to the Foundation for collaboration with directorates and offices of the Foundation outside of the Directorate as described under section 102(c)(7).

(e) FISCAL YEAR 2026.—

(1) FOUNDATION.—There is authorized to be appropriated to the Foundation $21,300,000,000 for fiscal year 2026.

(2) SPECIFIC NSF ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) $12,000,000,000 shall be made available to carry out the activities of the Foundation outside of the Directorate, of which $2,540,000,000 shall be for STEM education

and related activities, including workforce activities under section 202; and

(B) $9,300,000,000 shall be made available to the Directorate, of which—

(i) $3,069,000,000 shall be for the innovation centers under section 104;

(ii) $1,674,000,000 shall be for scholarships, fellowships, and other activities under section 106;

(iii) $1,302,000,000 shall be for academic technology transfer under section 109;

(iv) $930,000,000 shall be for test beds under section 108;

(v) $1,395,000,000 shall be for research and development activities under section 107; and

(vi) an amount equal to 10 percent of the total made available to the Directorate under this subparagraph shall be transferred to the Foundation for collaboration with directorates and offices of the Foundation outside of the Directorate as described under section 102(c)(7).

(f) ALLOCATION AND LIMITATIONS.—

(1) ALLOCATION FOR THE OFFICE OF INSPECTOR GENERAL.—From any amounts appropriated for the Foundation for a fiscal year, the Director shall allocate for necessary expenses of the Office of Inspector General of the Foundation an amount of not less than $33,000,000 in any fiscal year for oversight of the programs and activities funded under this section in accordance with the Inspector General Act of 1978 (5 U.S.C. App.).

(2) SUPPLEMENT AND NOT SUPPLANT.—The amounts authorized to be appropriated under this section shall supplement, and not supplant, any other amounts previously appropriated to the Office of the Inspector General of the Foundation.

(3) NO NEW AWARDS.—The Director shall not make any new awards for the activities under the Directorate for any fiscal year in which the total amount appropriated to the Foundation (not including amounts appropriated for the Directorate) is less than the total amount appropriated to the Foundation (not including such amounts), adjusted by the rate of inflation, for the previous fiscal year.

(4) NO FUNDS FOR CONSTRUCTION.—No funds provided to the Directorate under this section shall be used for construction.

SEC. 115. AUTHORIZATION OF APPROPRIATIONS FOR THE DEPARTMENT OF ENERGY.

(a) AUTHORIZATION OF APPROPRIATIONS.—

(1) FISCAL YEAR 2022.—There is authorized to be appropriated to the Department of Energy $1,000,000,000 for fiscal year 2022 to carry out research and development in the key technology focus areas.

(2) FISCAL YEAR 2023.—There is authorized to be appropriated to the Department of Energy $1,800,000,000 for fiscal year 2023 to carry out research and development in the key technology focus areas.

(3) FISCAL YEAR 2024.—There is authorized to be appropriated to the Department of Energy $3,700,000,000 for fiscal year 2024 to carry out research and development in the key technology focus areas.

(4) FISCAL YEAR 2025.—There is authorized to be appropriated to the Department of Energy $4,900,000,000 for fiscal year 2025 to carry out research and development in the key technology focus areas.

(5) FISCAL YEAR 2026.—There is authorized to be appropriated to the Department of Energy $5,500,000,000 for fiscal year 2026 to carry out re-

search and development in the key technology focus areas.

(b) SUPPLEMENT AND NOT SUPPLANT.—The amounts authorized to be appropriated under this section shall supplement, and not supplant, any other amounts previously authorized to be appropriated to the Department of Energy.

(c) NO FUNDS FOR CONSTRUCTION.—No funds provided to the Department of Energy under this section shall be used for construction.

On page 100, strike lines 8 through 14 and insert the following:

(c) DEPARTMENT OF ENERGY.—The Secretary of Energy shall use not less than 20 percent of the funds provided to the Department of Energy under section 115 for each fiscal year to carry out the program under section 2203(b)(3) of the Energy Policy Act of 1992 (42 U.S.C. 13503(b)(3)).

(d) CONSORTIA.—In the case of an award to a consortium under this Act, the Director may count the entire award toward meeting the funding requirements of this section if the lead entity of the consortium is located in a jurisdiction that is eligible to participate in the program under section 113 of the National Science Foundation Au-

thorization Act of 1988 (42 U.S.C. 1862g). In the case of an award to a consortium under this Act, the Secretary may count the entire award toward meeting the funding requirements of this section if the lead entity of the consortium is located in a jurisdiction that is eligible to participate in the program under section 2203(b)(3) of the Energy Policy Act of 1992 (42 U.S.C. 13503(b)(3)).