participate in this program at each National Laboratory and the number of employees who take a permanent leave from their positions at National Laboratories as a result of participating in this program.

(e) Federal ethics

Nothing in this section shall affect existing Federal ethics rules applicable to Federal personnel.

(Pub. L. 117–167, div. B, title VI, § 10719, Aug. 9, 2022, 136 Stat. 1707.)

§ 19313. National Laboratory non-Federal employee outside employment authority

(a) In general

The Secretary shall delegate to Directors of National Laboratories the authority to allow their non-Federal employees—

(1) to engage in outside employment, including start-up companies based on licensing technologies developed at National Laboratories and consulting in their areas of expertise, and receive compensation from such entities; and

(2) to engage in outside activities related to their areas of expertise at the National Laboratory and may allow employees, in their employment capacity at such outside employment, to access the National Laboratories under the same contracting mechanisms as non-Laboratory employees and entities, in accordance with appropriate conflict of interest protocols.

(b) Requirements

If a Director elects to use the authority granted by subsection (a) of this section, the Director, or their designee, shall—

(1) require employees to disclose to and obtain approval from the Director or their designee prior to engaging in any outside employment;

(2) develop and require appropriate conflict of interest protocols for employees that engage in outside employment;

(3) maintain the authority to terminate employees engaging in outside employment if they are found to violate terms, including conflict of interest protocols, mandated by the Director; and

(4) ensure that any such programs or activities are in conformance with the Department's research security policies, including DOE Order 486.1.

(c) Additional restrictions

Employees engaging in outside employment may not—

(1) allow such activities to interfere with or impede their duties at the National Laboratory;

(2) engage in activities related to outside employment using National Laboratory government equipment, property, or resources, unless such activities are performed under National Laboratory contracting mechanisms, such as Cooperative Research and Development Agreements or Strategic Partnership Projects, whereby all conflicts of interest requirements apply; or

(3) use their position at a National Laboratory to provide an unfair competitive advantage to an outside employer or start-up activity.

(d) Federal ethics

Nothing in this section shall affect existing Federal ethics rules applicable to Federal personnel.

(Pub. L. 117–167, div. B, title VI, § 10720, Aug. 9, 2022, 136 Stat. 1707.)

SUBPART 3—DEPARTMENT OF ENERGY MODERNIZATION

§ 19321. Special hiring authority for scientific, engineering, and project management personnel

(a) In general

The Under Secretary for Science shall have the authority to—

(1) make appointments of not more than 60 scientific, engineering, and professional personnel, without regard to civil service laws, to assist the Department in meeting specific project or research needs;

(2) fix the basic pay of any employee appointed under this section at a rate to be determined by the Under Secretary at rates not in excess of Level II of the Executive Schedule (EX–II) under section 5311 of title 5 without regard to the civil service laws; and

(3) pay any employee appointed under this section payments in addition to basic pay, except that the total amount of additional payments paid to an employee under this subsection for any 12-month period shall not exceed the lesser of the following amounts:

(A) $25,000.

(B) The amount equal to 25 percent of the annual rate of basic pay of that employee.

(C) The amount of the limitation that is applicable for a calendar year under section 5307(a)(1) of title 5.

(b) Term

(1) In general

The term of any employee appointed under this section shall not exceed 3 years unless otherwise authorized in law.

(2) Termination

The Under Secretary for Science shall have the authority to terminate any employee appointed under this section at any time based on performance or changing project or research needs of the Department.

(Pub. L. 117–167, div. B, title VI, § 10726, Aug. 9, 2022, 136 Stat. 1710.)

PART I—MICRO ACT

§ 19331. Microelectronics research for energy innovation

(a) Definitions

In this section:

(1) Center

The term ''Center'' means a Microelectronics Science Research Center established pursuant to subsection (d).

(2) Department

The term ''Department'' means the Department of Energy.

(3) Director

The term ''Director'' means the Director of the Office of Science.

(4) Historically Black college or university

The term ''historically Black college or university'' has the meaning given the term ''part B institution'' in section 1061 of title 20.

(5) Institution of higher education

The term ''institution of higher education'' has the meaning given the term in section 1001(a) of title 20.

(6) Microelectronics

The term ''microelectronics'' means—

(A) a semiconductor and related materials;
(B) processing chemistries;
(C) design technologies;
(D) fabrication technologies;
(E) lithography technologies;
(F) packaging technologies;
(G) a sensor;
(H) a device;
(I) an integrated circuit;
(J) a processor;
(K) computing architecture;
(L) modeling and simulation;
(M) a software tool; and
(N) any other related technology.

(7) Minority-serving institution

The term ''minority-serving institution'' means—

(A) a Hispanic-serving institution (as defined in section 1101a(a) of title 20);

(B) an Alaska Native-serving institution (as defined in section 1059d(b) of title 20);

(C) a Native Hawaiian-serving institution (as defined in that section);

(D) a Predominantly Black Institution (as defined in section 1067q(c) of title 20);

(E) an Asian American and Native American Pacific Islander-serving institution (as defined in that section); and

(F) a Native American-serving nontribal institution (as defined in that section).

(8) National Laboratory

The term ''National Laboratory'' has the meaning given the term in section 15801 of this title.

(9) Program

The term ''program'' means the program established under subsection (c)(1).

(10) Secretary

The term ''Secretary'' means the Secretary of Energy.

(11) Skilled technical workforce

The term ''skilled technical workforce'' has the meaning given the term in section 4(b)(3) of the Innovations in Mentoring, Training, and Apprenticeships Act (42 U.S.C. 1862p note; Public Law 115–402).

(12) Tribal College or University

The term ''Tribal College or University'' has the meaning given the term in section 1059c of title 20.

(13) Work-based learning

The term ''work-based learning'' has the meaning given the term in section 2302 of title 20.

(b) Findings

Congress finds that—

(1) the coming end of Moore's Law presents major technological challenges and opportunities for the United States and has important implications for national security, economic competitiveness, and scientific discovery;

(2) future progress and innovation in microelectronics, and the maintenance of a robust domestic microelectronics supply chain, will require an approach that advances relevant materials science, electronic and photonic device technologies, processing and packaging technologies, manufacturing technologies, circuit, chip, and system architecture, and software system and algorithm development in a codesign fashion;

(3) the National Laboratories possess unique technical expertise and user facilities that are essential to—

(A) overcoming foundational research challenges relevant to the topics described in paragraph (2); and

(B) translating and transferring research outcomes to industry; and

(4) the expertise and user facilities of the National Laboratories described in paragraph (3) will enable the Department to drive advances in microelectronics that are essential to meeting future needs in areas critical to the missions of the Department and the future competitiveness of the domestic microelectronics industry, including high-performance computing, emerging data-centric computing approaches and energy-efficient computing, optical sensors, sources, and wireless networks, and power electronics and electricity delivery systems.

(c) Microelectronics research program

(1) In general

The Secretary shall carry out a crosscutting program of research, development, and demonstration of microelectronics relevant to the missions of the Department to enable advances and breakthroughs that will—

(A) accelerate underlying research and development for design, development, and manufacturability of next-generation microelectronics; and

(B) ensure the global competitiveness of the United States in the field of microelectronics.

(2) Research projects

(A) In general

In carrying out the program, the Secretary shall provide financial assistance to eligible entities described in subparagraph (B) to carry out research projects in—

(i) foundational science areas, including—

(I) materials sciences, chemical sciences, and plasma science synthesis and fabrication;

(II) novel microelectronics devices, including emerging memory and storage technologies;

(III) diverse computing architectures and paradigms, including analog computing and edge computing;

(IV) data-driven modeling and simulation;

(V) integrated sensing, power harvesting, and communications;

(VI) component integration and subsystems;

(VII) photonic integration and packaging; and

(VIII) development of codesign frameworks for all stages of microelectronics design, development, fabrication, and application;

(ii) cybersecurity by design to result in trusted and resilient microelectronics;

(iii) methods for leveraging advanced simulation and artificial intelligence to enhance codesign and discovery in microelectronics;

(iv) in consultation with the National Institute of Standards and Technology, fabrication and processing science and metrology associated with microelectronics manufacturing, including lithography, patterning, surface deposition, etching, and cleaning;

(v) approaches for optimizing system-level energy efficiency of advanced computing systems, the electrical grid, power electronics, and other energy infrastructure;

(vi) approaches for enhancing the durability and lifetime of radiation-hardened electronics;

(vii) enhancement of microelectronics security, including the development of integrated devices, packages, and thermal management for severe environments and national security;

(viii) in coordination with other relevant initiatives of the Department, methods to improve the lifetime, maintenance, recycling, reuse, and sustainability of microelectronics components and systems, including technologies and strategies that reduce the use of energy, water, critical materials, and other commodities that the Secretary determines are vulnerable to disruption; and

(ix) methods and techniques for domestic processing of materials for microelectronics and components of microelectronics.

(B) Eligible entities

An eligible entity referred to in subparagraph (A) is—

(i) an institution of higher education, including a historically Black college or university, a Tribal College or University, and a minority-serving institution;

(ii) a nonprofit research organization;

(iii) a State research agency;

(iv) a National Laboratory;

(v) a private commercial entity;

(vi) a partnership or consortium of 2 or more entities described in clauses (i) through (v); and

(vii) any other entity that the Secretary determines appropriate.

(C) Notification

Not later than 30 days after the Secretary provides financial assistance to an eligible entity under subparagraph (A), the Secretary shall submit to the Committee on Energy and Natural Resources of the Senate and the Committee on Science, Space, and Technology of the House of Representatives a notification of the financial assistance provided, including—

(i) the criteria used by the Secretary to select the eligible entity receiving the financial assistance;

(ii) the manner in which the criteria described in clause (i) comport with the purposes of the program described in paragraph (1); and

(iii) a description of the research project that the eligible entity will carry out using the financial assistance.

(3) Technology transfer

In carrying out the program, the Secretary, in coordination with the Director of the Office of Technology Transitions and in consultation with the private sector, shall—

(A) support translational research and transfer of microelectronics technologies; and

(B) identify emerging research and development needs of industry and government for the benefit of United States economic competitiveness.

(4) Workforce development

In carrying out the program, the Secretary shall support—

(A) workforce development through existing authorities and mechanisms available to the Department, including internships, fellowships, individual investigator grants, and other activities the Secretary determines appropriate; and

(B) in consultation with the National Science Foundation, as appropriate, education and outreach activities—

(i) to disseminate information and promote understanding of microelectronics and related fields among students at elementary school, secondary school, high school, undergraduate, and graduate levels; and

(ii) that may include educational programming with an emphasis on experiential and project-based learning.

(5) Outreach

The Secretary shall conduct outreach to recruit applicants to the program and engage participants from all regions of the United States, especially individuals from underserved communities and groups historically underrepresented in science, technology, engineering, and mathematics.

(6) Coordination

In carrying out the program, the Secretary shall—

(A) coordinate across all relevant programs and offices of the Department; and

(B) coordinate the research carried out under the program relating to microelec-

tronics with activities carried out by other Federal agencies and programs relating to microelectronics research, development, manufacturing, and supply chain security, including the programs authorized under subsections (c) through (f) of section 4656 of title 15.

(7) Report

Not later than 180 days after August 9, 2022, the Secretary shall submit to the Committee on Energy and Natural Resources of the Senate and the Committee on Science, Space, and Technology of the House of Representatives a report describing the goals, priorities, and anticipated outcomes of the program.

(8) Funding

There are authorized to be appropriated to the Secretary to carry out this subsection—

(A) $75,000,000 for fiscal year 2023;
(B) $100,000,000 for fiscal year 2024;
(C) $100,000,000 for fiscal year 2025;
(D) $100,000,000 for fiscal year 2026; and
(E) $100,000,000 for fiscal year 2027.

(d) Microelectronics Science Research Centers

(1) In general

In carrying out the program, subject to the availability of appropriations, the Director shall establish not more than 4 Microelectronics Science Research Centers, each comprising 1 or more eligible entities—

(A) to conduct mission-driven research to address foundational challenges in the design, development, characterization, prototyping, demonstration, and fabrication of microelectronics; and
(B) to facilitate the translation of research results to industry.

(2) Eligible entities

An eligible entity referred to in paragraph (1) is—

(A) a National Laboratory;
(B) an institution of higher education, including a historically Black college or university, a Tribal College or University, and a minority-serving institution;
(C) a private commercial entity;
(D) a research center;
(E) a partnership or consortium of 2 or more entities described in subparagraphs (A) through (D); and
(F) any other entity that the Secretary determines appropriate.

(3) Activities

The activities of a Center shall include research, development, and demonstration activities for—

(A) accelerating the development of new microelectronics science and technology, including materials, devices, circuits, systems, architectures, fabrication tools, processes, diagnostics, modeling, synthesis, and, in consultation with the National Institute of Standards and Technology, metrology;
(B) advancing the sustainability and energy efficiency of new microelectronics devices, packages, and systems;
(C) application-driven codesign and prototyping of novel devices to facilitate laboratory-to-fabrication transition;
(D) advancing knowledge and experimental capabilities in surface and materials science, plasma science, and computational and theoretical methods, including artificial intelligence, multiscale codesign, and advanced supercomputing capabilities to invent and manufacture revolutionary microelectronic devices;
(E) creating technology testbeds for prototyping platforms for validation and verification of new capabilities and sharing of ideas, intellectual property, and the unique facilities of the Department;
(F) supporting development of cybersecurity capabilities for computing architectures that measurably improve safety and security and are adaptable for existing and future applications; and
(G) supporting long-term and short-term workforce development in microelectronics.

(4) Request for proposals; merit review

(A) In general

The Director shall, at such time, in such manner, and containing such information as the Director determines to be appropriate, issue a request for proposals from eligible entities described in paragraph (2) seeking to be designated as a Center.

(B) Competitive merit review

The Director shall select eligible entities under subparagraph (A) through a competitive, merit-based process.

(5) Operation

(A) Duration

(i) In general

Each Center shall operate for a period of not more than 5 years, unless renewed for an additional 5-year period in accordance with clause (ii).

(ii) Renewal

(I) Initial renewal

In the case of a Center that has operated for not more than 5 years, the Director may renew support for the Center on a merit-reviewed basis for a period of not more than 5 years.

(II) 10-year operation

In the case of a Center that has operated for not less than 5 years but not more than 10 years, the Director may renew support for the Center on a competitive, merit-reviewed basis for a period of not more than 5 years.

(III) 15-year operation

In the case of a Center that has operated for not less than 10 years but not more than 15 years, the Director may renew support for the Center on a merit-reviewed basis for a period of not more than 5 years.

(B) Termination

Consistent with the existing authorities of the Department, the Director may terminate an underperforming Center during the performance period.

(6) Technology transfer

The Director, in coordination with the Director of the Office of Technology Transitions,

shall seek to enter into partnerships with industry groups to facilitate the translation and transfer of research results produced by the Centers.

(7) Coordination

The Secretary shall—

(A) establish a coordinating network to coordinate cross-cutting research and foster communication and collaboration among the Centers; and

(B) ensure coordination, and avoid unnecessary duplication, of the activities of each Center with the activities of—

(i) other research entities of the Department, including—

(I) the Nanoscale Science Research Centers;

(II) the National Quantum Information Science Research Centers;

(III) the Energy Frontier Research Centers;

(IV) the Energy Innovation Hubs;

(V) the National Laboratories; and

(VI) other offices of the Department;

(ii) the National Semiconductor Technology Center established under section 4656(c)(1) of title 15;

(iii) institutions of higher education;

(iv) industry; and

(v) relevant research activities carried out by other Federal agencies.

(8) Workforce development

Each Center shall support workforce development through—

(A) incorporation of undergraduate students, postdoctoral fellows, graduate students, and early career researchers, as well as elementary school, secondary school, and high school students, through opportunities such as dual-enrollment programs and work-based learning programs, as applicable;

(B) hands-on research and equipment training programs;

(C) technical training and certificate programs for the skilled technical workforce;

(D) facilitation of engagement among academic, industry, and laboratory researchers; and

(E) public outreach activities, including to students at elementary school, secondary school, high school, undergraduate, and graduate levels, which may include educational programming with an emphasis on experiential and project-based learning.

(9) Outreach

The Director shall support the workforce development of Centers under paragraph (8) by conducting outreach to recruit applicants and engage participants from all regions of the United States, especially individuals from underserved communities and groups historically underrepresented in science, technology, engineering, and mathematics.

(10) Intellectual property

The Secretary shall ensure that the intellectual property and value proposition created by the Centers are retained within the United States.

(11) Notification

(A) Definition of covered determination

In this paragraph, the term ''covered determination'' means a determination of the Secretary—

(i) to establish a Center under paragraph (1);

(ii) to renew support for a Center under paragraph (5)(A)(ii); or

(iii) to terminate a Center under paragraph (5)(B).

(B) Notification

Not later than 30 days after the Secretary makes a covered determination, the Secretary shall submit to the Committee on Energy and Natural Resources of the Senate and the Committee on Science, Space, and Technology of the House of Representatives a notification of the covered determination, including—

(i) the criteria used by the Secretary to make the covered determination; and

(ii) the manner in which the criteria described in clause (i) comport with the purposes of the program described in paragraph (1).

(12) Funding

Subject to the availability of appropriations, the Secretary shall use not more than $25,000,000 to fund each Center for each of fiscal years 2023 through 2027.

(Pub. L. 117–167, div. B, title VI, § 10731, Aug. 9, 2022, 136 Stat. 1711.)

PART J—APPLIED LABORATORIES INFRASTRUCTURE RESTORATION AND MODERNIZATION

§ 19341. Applied laboratories infrastructure restoration and modernization

(a) Definition of National Laboratory.

In this section, the term ''National Laboratory'' means—

(1) the National Renewable Energy Laboratory;

(2) the National Energy Technology Laboratory;

(3) the Idaho National Laboratory;

(4) the Savannah River National Laboratory;

(5) the Sandia National Laboratories;

(6) the Los Alamos National Laboratory; and

(7) the Lawrence Livermore National Laboratory.

(b) Restoration and modernization projects

(1) In general

The Secretary shall fund projects described in paragraph (2) as needed to address the deferred maintenance, critical infrastructure needs, and modernization of National Laboratories.

(2) Projects described

The projects referred to in paragraph (1) are, as determined by the Secretary—

(A) priority deferred maintenance projects at National Laboratories, including facilities sustainment for, upgrade of, and construction of research laboratories, adminis-