

ordination with directors of the National Laboratories, shall submit to the appropriate committees of Congress a report that—

- (A) assesses the overall effectiveness of the pilot program referred to in subsection (a);
- (B) identifies opportunities to improve the effectiveness of the pilot program;
- (C) assesses the potential for program activities to interfere with the responsibilities of the National Laboratories to the Department; and
- (D) provides a recommendation regarding the future of the pilot program.

**(2) Transparency**

The Secretary, in coordination with directors of the National Laboratories, shall submit to the appropriate committees of Congress an annual report that accounts for all incidences of, and provides a justification for, non-Federal entities using funds derived from a Federal contract or award to carry out agreements pursuant to this section.

(Pub. L. 115-246, title I, §107, Sept. 28, 2018, 132 Stat. 3132.)

SUBCHAPTER II—DEPARTMENT OF ENERGY RESEARCH COORDINATION

**§ 18631. Crosscutting research and development**

**(a) In general**

The Secretary shall use the capabilities of the Department to identify strategic opportunities for collaborative research, development, demonstration, and commercial application of innovative science and technologies.

**(b) Existing programs; coordination of activities**

To the maximum extent practicable, the Secretary shall seek—

- (1) to leverage existing programs of the Department; and
- (2) to consolidate and coordinate activities throughout the Department to promote collaboration and crosscutting approaches within programs of the Department.

**(c) Additional actions**

The Secretary shall—

- (1) prioritize activities that use all affordable domestic resources;
- (2) develop a planning, evaluation, and technical assessment framework for setting objective long-term strategic goals and evaluating progress that—
  - (A) ensures integrity and independence; and
  - (B) provides the flexibility to adapt to market dynamics;
- (3) ensure that activities shall be undertaken in a manner that does not duplicate other activities within the Department or other Federal Government activities; and
- (4) identify programs that may be more effectively left to the States, industry, nongovernmental organizations, institutions of higher education, or other stakeholders.

(Pub. L. 115-246, title II, §203, Sept. 28, 2018, 132 Stat. 3135.)

**§ 18632. Energy Innovation Hubs**

**(a) Definitions**

In this section:

**(1) Advanced energy technology**

The term “advanced energy technology” means—

- (A) an innovative technology—
  - (i) that produces energy from solar, wind, geothermal, biomass, tidal, wave, ocean, or other renewable energy resources;
  - (ii) that produces nuclear energy;
  - (iii) for carbon capture and sequestration;
  - (iv) that enables advanced vehicles, vehicle components, and related technologies that result in significant energy savings;
  - (v) that generates, transmits, distributes, uses, or stores energy more efficiently than conventional technologies, including through Smart Grid technologies; or
  - (vi) that enhances the energy independence and security of the United States by enabling improved or expanded supply and production of domestic energy resources, including coal, oil, and natural gas;
- (B) a research, development, demonstration, or commercial application activity necessary to ensure the long-term, secure, and sustainable supply of an energy-critical element; or
- (C) any other innovative energy technology area identified by the Secretary.

**(2) Hub**

**(A) In general**

The term “Hub” means an Energy Innovation Hub established under this section.

**(B) Inclusion**

The term “Hub” includes any Energy Innovation Hub in existence on September 28, 2018.

**(3) Qualifying entity**

The term “qualifying entity” means—

- (A) an institution of higher education;
- (B) an appropriate State or Federal entity, including a federally funded research and development center of the Department;
- (C) a nongovernmental organization with expertise in advanced energy technology research, development, demonstration, or commercial application; or
- (D) any other relevant entity the Secretary determines appropriate.

**(b) Authorization of program**

**(1) In general**

The Secretary shall carry out a program to enhance the economic, environmental, and energy security of the United States by making awards to consortia for establishing and operating hubs, to be known as “Energy Innovation Hubs”, to conduct and support, at, if practicable, one centralized location, multidisciplinary, collaborative research, development, demonstration, and commercial application of advanced energy technologies.

**(2) Technology development focus**

The Secretary shall designate for each Hub a unique advanced energy technology or basic research focus.

**(3) Coordination**

The Secretary shall ensure the coordination of, and avoid unnecessary duplication of, the activities of each Hub with the activities of—

- (A) other research entities of the Department, including the National Laboratories, the Advanced Research Projects Agency—Energy, and Energy Frontier Research Centers; and
- (B) industry.

**(c) Application process****(1) Eligibility**

To be eligible to receive an award for the establishment and operation of a Hub under subsection (b)(1), a consortium shall—

- (A) be composed of not fewer than two qualifying entities;
- (B) 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 Hub;
  - (ii) measures the consortium will undertake to enable cost-effective implementation of activities under the program described in subsection (b)(1); and
  - (iii) a proposed budget, including financial contributions from non-Federal sources; and
- (C) operate as a nonprofit organization.

**(2) Application****(A) In general**

A consortium seeking to establish and operate a Hub under subsection (b)(1) shall submit to the Secretary an application at such time, in such manner, and containing such information as the Secretary may require, including a detailed description of each element of the consortium agreement required under paragraph (1)(B).

**(B) Requirement**

If the consortium members will not be located at one centralized location, the application under subparagraph (A) shall include a communications plan that ensures close coordination and integration of Hub activities.

**(3) Selection****(A) In general**

The Secretary shall select consortia for awards for the establishment and operation of Hubs through a competitive selection process.

**(B) Considerations**

In selecting consortia under subparagraph (A), the Secretary shall consider—

- (i) the information disclosed by the consortium under this subsection; and
- (ii) any existing facilities a consortium will provide for Hub activities.

**(d) Term****(1) In general**

An award made to a Hub under this section shall be for a period of not more than 5 years,

subject to the availability of appropriations, after which the award may be renewed, subject to a rigorous merit review.

**(2) Existing Hubs**

A Hub already in existence on, or undergoing a renewal process on, September 28, 2018—

- (A) may continue to receive support during the 5-year period beginning on the date of establishment of that Hub; and
- (B) shall be eligible for renewal of that support at the end of that 5-year period.

**(e) Hub operations****(1) In general**

Each Hub shall conduct or provide for multidisciplinary, collaborative research, development, demonstration, and commercial application of advanced energy technologies within the technology development focus designated under subsection (b)(2).

**(2) Activities**

Each Hub shall—

- (A) encourage collaboration and communication among the member qualifying entities of the consortium and awardees;
- (B) develop and publish proposed plans and programs on a publicly accessible website;
- (C) submit an annual report to the Department summarizing the activities of the Hub, including—
  - (i) detailing organizational expenditures; and
  - (ii) describing each project undertaken by the Hub; and
- (D) monitor project implementation and coordination.

**(3) Conflicts of interest**

Each Hub shall maintain conflict of interest procedures, consistent with the conflict of interest procedures of the Department.

**(4) Prohibition on construction****(A) In general**

Except as provided in subparagraph (B)—

- (i) no funds provided under this section may be used for construction of new buildings or facilities for Hubs; and
- (ii) construction of new buildings or facilities shall not be considered as part of the non-Federal share of a Hub cost-sharing agreement.

**(B) Test bed and renovation exception**

Nothing in this paragraph prohibits the use of funds provided under this section or non-Federal cost share funds for the construction of a test bed or renovations to existing buildings or facilities for the purposes of research if the Secretary determines that the test bed or renovations are limited to a scope and scale necessary for the research to be conducted.

(Pub. L. 115-246, title II, §206, Sept. 28, 2018, 132 Stat. 3137.)

SUBCHAPTER III—DEPARTMENT OF  
ENERGY OFFICE OF SCIENCE POLICY

**§ 18641. Basic energy sciences**

**(a) Program**

As part of the activities authorized under section 7139 of this title, the Director shall carry out a research and development program in basic energy sciences, including materials sciences and engineering, chemical sciences, physical biosciences, geosciences, and other disciplines, to understand, model, and control matter and energy at the electronic, atomic, and molecular levels in order to provide the foundations for new energy technologies, address scientific grand challenges, and support the energy, environment, and national security missions of the Department.

**(b) Sustainable chemistry**

In carrying out chemistry-related research and development activities under this section, the Director shall prioritize research and development of sustainable chemistry to support clean, safe, and economic alternatives and methodologies to traditional chemical products and processes.

**(c) Energy Frontier Research Centers**

**(1) In general**

The Director shall carry out a program to provide awards, on a competitive, merit-reviewed basis, to multi-institutional collaborations or other appropriate entities to conduct fundamental and use-inspired energy research to accelerate scientific breakthroughs.

**(2) Collaborations**

A collaboration receiving an award under this subsection may include multiple types of institutions and private sector entities.

**(3) Selection and duration**

**(A) In general**

A collaboration under this subsection shall be selected for a period of 4 years.

**(B) Existing centers**

An Energy Frontier Research Center in existence and supported by the Director on September 28, 2018, may continue to receive support for a period of 4 years beginning on the date of establishment of that center.

**(C) Reapplication**

After the end of the period described in subparagraph (A) or (B), as applicable, a recipient of an award may reapply for selection on a competitive, merit-reviewed basis.

**(D) Termination**

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

**(4) No funding for construction**

No funding provided pursuant to this subsection may be used for the construction of new buildings or facilities.

**(d) Basic energy sciences user facilities**

**(1) In general**

The Director shall carry out a program for the development, construction, operation, and maintenance of national user facilities.

**(2) Requirements**

To the maximum extent practicable, the national user facilities developed, constructed, operated, or maintained under paragraph (1) shall serve the needs of the Department, industry, the academic community, and other relevant entities to create and examine materials and chemical processes for the purpose of improving the competitiveness of the United States.

**(3) Included facilities**

The national user facilities developed, constructed, operated, or maintained under paragraph (1) shall include—

(A) x-ray light sources;

(B) neutron sources;

(C) nanoscale science research centers;

(D) autonomous chemistry and materials synthesis and characterization facilities that leverage advances in artificial intelligence; and

(E) such other facilities as the Director considers appropriate, consistent with section 7139 of this title.

**(4) Advanced Photon Source upgrade**

**(A) Definitions**

In this paragraph:

**(i) Flux**

The term “flux” means the rate of flow of photons.

**(ii) Hard x-ray**

The term “hard x-ray” means a photon with energy greater than 20 kiloelectron volts.

**(B) Upgrade**

The Secretary shall provide for the upgrade to the Advanced Photon Source described in the publication approved by the Basic Energy Sciences Advisory Committee on June 9, 2016, entitled “Report on Facility Upgrades”, including the development of a multibend achromat lattice to produce a high flux of coherent x-rays within the hard x-ray energy region and a suite of beamlines optimized for this source.

**(C) Start of operations**

The Secretary shall, subject to the availability of appropriations, ensure that the start of full operations of the upgrade under this paragraph occurs before March 31, 2026.

**(D) Funding**

Out of funds authorized to be appropriated under subsection (j), there is authorized to be appropriated to the Secretary to carry out the upgrade under this paragraph \$14,200,000 for fiscal year 2023.

**(5) Spallation Neutron Source proton power upgrade**

**(A) In general**

The Secretary shall provide for the proton power upgrade to the Spallation Neutron Source.

**(B) Proton power upgrade defined**

In this paragraph, the term “proton power upgrade” means the Spallation Neutron Source power upgrade described in—