

through an independent contracting entity, a program of education and outreach on biobased fuels and biobased products consisting of—

- (1) training and technical assistance programs for feedstock producers to promote producer ownership, investment, and participation in the operation of processing facilities; and
- (2) public education and outreach to familiarize consumers with the biobased fuels and biobased products.

(b) Authorization of appropriations

There is authorized to be appropriated to carry out this section \$1,000,000 for each of fiscal years 2006 through 2010.

(Pub. L. 109–58, title IX, §947, Aug. 8, 2005, 119 Stat. 883.)

PART E—NUCLEAR ENERGY

§ 16271. Nuclear energy

(a) Mission

(1) In general

The Secretary shall carry out programs of civilian nuclear research, development, demonstration, and commercial application, including activities under this part.

(2) Considerations

The programs carried out under paragraph (1) shall take into consideration the following objectives:

- (A) Providing research infrastructure to promote scientific progress and enable users from academia, the National Laboratories, and the private sector to make scientific discoveries relevant for nuclear, chemical, and materials science engineering.
- (B) Maintaining nuclear energy research and development programs at the National Laboratories and institutions of higher education, including infrastructure at the National Laboratories and institutions of higher education.
- (C) Providing the technical means to reduce the likelihood of nuclear proliferation.
- (D) Increasing confidence margins for public safety of nuclear energy systems.
- (E) Reducing the environmental impact of activities relating to nuclear energy.
- (F) Supporting technology transfer from the National Laboratories to the private sector.
- (G) Enabling the private sector to partner with the National Laboratories to demonstrate novel reactor concepts for the purpose of resolving technical uncertainty associated with the objectives described in subparagraphs (A) through (F).

(b) Definitions

In this part:

(1) Advanced nuclear reactor

The term “advanced nuclear reactor” means—

- (A) a nuclear fission reactor, including a prototype plant (as defined in sections 50.2 and 52.1 of title 10, Code of Federal Regulations (or successor regulations)), with sig-

nificant improvements compared to reactors operating on December 27, 2020, including improvements such as—

- (i) additional inherent safety features;
 - (ii) lower waste yields;
 - (iii) improved fuel and material performance;
 - (iv) increased tolerance to loss of fuel cooling;
 - (v) enhanced reliability or improved resilience;
 - (vi) increased proliferation resistance;
 - (vii) increased thermal efficiency;
 - (viii) reduced consumption of cooling water and other environmental impacts;
 - (ix) the ability to integrate into electric applications and nonelectric applications;
 - (x) modular sizes to allow for deployment that corresponds with the demand for electricity or process heat; and
 - (xi) operational flexibility to respond to changes in demand for electricity or process heat and to complement integration with intermittent renewable energy or energy storage;
- (B) a fusion reactor; and
- (C) a radioisotope power system that utilizes heat from radioactive decay to generate energy.

(2) Commission

The term “Commission” means the Nuclear Regulatory Commission.

(3) Fast neutron

The term “fast neutron” means a neutron with kinetic energy above 100 kiloelectron volts.

(4) National Laboratory

(A) In general

Except as provided in subparagraph (B), the term “National Laboratory” has the meaning given the term in section 15801 of this title.

(B) Limitation

With respect to the Lawrence Livermore National Laboratory, the Los Alamos National Laboratory, and the Sandia National Laboratories, the term “National Laboratory” means only the civilian activities of the laboratory.

(5) Neutron flux

The term “neutron flux” means the intensity of neutron radiation measured as a rate of flow of neutrons applied over an area.

(6) Neutron source

The term “neutron source” means a research machine that provides neutron irradiation services for—

- (A) research on materials sciences and nuclear physics; and
- (B) testing of advanced materials, nuclear fuels, and other related components for reactor systems.

(Pub. L. 109–58, title IX, §951, Aug. 8, 2005, 119 Stat. 884; Pub. L. 115–248, §2(a), Sept. 28, 2018, 132 Stat. 3154; Pub. L. 116–260, div. Z, title II, §2002, Dec. 27, 2020, 134 Stat. 2459; Pub. L. 117–58, div. D, title X, §41002(b)(1), Nov. 15, 2021, 135 Stat. 1127.)

Editorial Notes

AMENDMENTS

2021—Subsec. (b)(1)(C). Pub. L. 117-58 added subpar. (C).

2020—Subsec. (b)(1). Pub. L. 116-260 amended par. (1) generally. Prior to amendment, par. (1) defined the term “advanced nuclear reactor”.

2018—Pub. L. 115-248 amended section generally. Prior to amendment, section related to civilian nuclear energy research programs and authorizations of appropriations to carry out such programs.

Statutory Notes and Related Subsidiaries

WAGE RATE REQUIREMENTS

For provisions relating to rates of wages to be paid to laborers and mechanics on projects for construction, alteration, or repair work funded under div. D or an amendment by div. D of Pub. L. 117-58, including authority of Secretary of Labor, see section 18851 of this title.

§ 16272. Reactor concepts research, development, demonstration, and commercial application**(a) Sustainability program for light water reactors****(1) In general**

The Secretary shall carry out a program of research, development, demonstration, and commercial application, including through the use of modeling and simulation, to support existing operating nuclear power plants which shall address technologies to modernize and improve, with respect to such plants—

- (A) reliability;
- (B) capacity;
- (C) component aging;
- (D) safety;
- (E) physical security and security costs;
- (F) plant lifetime;
- (G) operations and maintenance costs, including by utilizing risk-informed systems analysis;
- (H) the ability for plants to operate flexibly;
- (I) nuclear integrated energy system applications described in subsection (c);
- (J) efficiency;
- (K) environmental impacts; and
- (L) resilience.

(2) Isotope demonstration evaluation**(A) In general**

Not later than 1 year after August 9, 2022, the Secretary, acting through the Assistant Secretary for Nuclear Energy, shall evaluate the technical and economic feasibility of establishing and, if feasible, is authorized to establish an isotope demonstration subprogram of the program established under paragraph (1) to support the development and commercial demonstration of critical radioactive and stable isotope production in existing commercial nuclear power plants.

(B) Consultation

The Secretary, acting through the Assistant Secretary for Nuclear Energy, shall consult with the Director of the Office of Science in carrying out the evaluation under subparagraph (A).

(C) Definition of critical radioactive and stable isotope

In this paragraph, the term “critical radioactive and stable isotope” has the meaning given the term in section 18649(a) of this title.

(3) Report

The Secretary shall submit annually a public report to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate documenting funds spent under the program that describes program activities, objectives, and outcomes, including those that could benefit the entirety of the existing reactor fleet, such as with respect to aging management and related sustainability concerns, and identifying funds awarded to private entities.

(4) Authorization of appropriations

There are authorized to be appropriated to the Secretary to carry out the program under this subsection \$55,000,000 for each of fiscal years 2021 through 2025.

(b) Advanced reactor technologies**(1) In general**

The Secretary shall carry out a program of research, development, demonstration, and commercial application to support advanced reactor technologies.

(2) Requirements

In carrying out the program under this subsection, the Secretary shall—

(A) prioritize designs for advanced nuclear reactors that are proliferation resistant and passively safe, including designs that, compared to reactors operating on December 27, 2020—

- (i) are economically competitive with other electric power generation plants;
- (ii) have higher efficiency, lower cost, less environmental impacts, increased resilience, and improved safety;
- (iii) use fuels that are proliferation resistant and have reduced production of high-level waste per unit of output; and
- (iv) use advanced instrumentation and monitoring systems;

(B) consult with the Nuclear Regulatory Commission on appropriate metrics to consider for the criteria specified in subparagraph (A);

(C) support research and development to resolve materials challenges relating to extreme environments, including environments that contain high levels of—

- (i) radiation fluence;
- (ii) temperature;
- (iii) pressure; and
- (iv) corrosion;

(D) support research and development to aid in the qualification of advanced fuels, including fabrication techniques;

(E) support activities that address near-term challenges in modeling and simulation to enable accelerated design of and licensing of advanced nuclear reactors, including the