versity research program to design and test, in consultation with the Tennessee Valley Authority, state-of-the-art optimization techniques for power flow through existing high voltage transmission lines.

(Pub. L. 109–58, title IX, § 925, Aug. 8, 2005, 119 Stat. 865; Pub. L. 116–260, div. Z, title VIII, § 8004(a), Dec. 27, 2020, 134 Stat. 2583.)

AMENDMENTS

2020—Subsec. (a)(10) to (13). Pub. L. 116–260 added pars. (10) and (11) and redesignated former pars. (10) and (11) as (12) and (13), respectively.

COORDINATION OF EFFORTS

Pub. L. 116–260, div. Z, title VIII, § 8006, Dec. 27, 2020, 134 Stat. 2586, provided that: ''In carrying out the amendments made by this title [enacting sections 16236, 17014, 17384a, 17387, and 17388 of this title and amending this section, section 17384 of this title and sections 3501 and 3502 of Title 25, Indians], the Secretary [probably means Secretary of Energy] shall coordinate with relevant entities to the maximum extent practicable, including—

''(1) electric utilities;

''(2) private sector entities;

''(3) representatives of all sectors of the electric power industry;

''(4) transmission organizations;

''(5) transmission owners and operators;

''(6) distribution organizations;

''(7) distribution asset owners and operators;

''(8) State, Tribal, local, and territorial governments and regulatory authorities;

''(9) academic institutions;

''(10) the National Laboratories;

''(11) other Federal agencies;

''(12) nonprofit organizations;

''(13) the Federal Energy Regulatory Commission;

''(14) the North American Reliability Corporation;

''(15) independent system operators; and

''(16) programs and program offices at the Department.''

PART C—RENEWABLE ENERGY

§ 16231. Renewable energy

(a) In general

(1) Objectives

The Secretary shall conduct programs of renewable energy research, development, demonstration, and commercial application, including activities described in this part. Such programs shall take into consideration the following objectives:

(A) Increasing the conversion efficiency of all forms of renewable energy through improved technologies.

(B) Decreasing the cost of renewable energy generation and delivery.

(C) Promoting the diversity of the energy supply.

(D) Decreasing the dependence of the United States on foreign energy supplies.

(E) Improving United States energy security.

(F) Decreasing the environmental impact of energy-related activities.

(G) Increasing the export of renewable generation equipment from the United States.

(2) Programs

(A) Geothermal

The Secretary shall conduct a program of research, development, demonstration, and commercial application for geothermal energy. The program shall focus on developing improved technologies for reducing the costs of geothermal energy installations, including technologies for—

(i) improving detection of geothermal resources;

(ii) decreasing drilling costs;

(iii) decreasing maintenance costs through improved materials;

(iv) increasing the potential for other revenue sources, such as mineral production; and

(v) increasing the understanding of reservoir life cycle and management.

(B) Hydropower

The Secretary shall conduct a program of research, development, demonstration, and commercial application for cost competitive technologies that enable the development of new and incremental hydropower capacity, adding to the diversity of the energy supply of the United States, including:

(i) Fish-friendly large turbines.

(ii) Advanced technologies to enhance environmental performance and yield greater energy efficiencies.

(C) Miscellaneous projects

The Secretary shall conduct research, development, demonstration, and commercial application programs for—

(i) ocean energy, including wave energy;

(ii) the combined use of renewable energy technologies with one another and with other energy technologies, including the combined use of wind power and coal gasification technologies;

(iii) renewable energy technologies for cogeneration of hydrogen and electricity; and

(iv) kinetic hydro turbines.

(b) Authorization of appropriations

There are authorized to be appropriated to the Secretary to carry out renewable energy research, development, demonstration, and commercial application activities, including activities authorized under this part—

(1) $632,000,000 for fiscal year 2007;

(2) $743,000,000 for fiscal year 2008;

(3) $852,000,000 for fiscal year 2009; and

(4) $963,000,000 for fiscal year 2010.

(c) Bioenergy

From the amounts authorized under subsection (b), there are authorized to be appropriated to carry out section 16232 of this title—

(1) $213,000,000 for fiscal year 2007, of which $100,000,000 shall be for section 16232(d) of this title;

(2) $377,000,000 for fiscal year 2008, of which $125,000,000 shall be for section 16232(d) of this title;

(3) $398,000,000 for fiscal year 2009, of which $150,000,000 shall be for section 16232(d) of this title; and

(4) $419,000,000 for fiscal year 2010, of which $150,000,000 shall be for section 16232(d) of this title.

(d) Administration

Of the funds authorized under subsection (c), not less than $5,000,000 for each fiscal year shall be made available for grants to—

(1) part B institutions;

(2) Tribal Colleges or Universities (as defined in section 1059c(b) of title 20); and

(3) Hispanic-serving institutions.

(e) Rural demonstration projects

In carrying out this section, the Secretary, in consultation with the Secretary of Agriculture, shall demonstrate the use of renewable energy technologies to assist in delivering electricity to rural and remote locations including —

(1) advanced wind power technology, including combined use with coal gasification;

(2) biomass; and

(3) geothermal energy systems.

(f) Analysis and evaluation

(1) In general

The Secretary shall conduct analysis and evaluation in support of the renewable energy programs under this part. These activities shall be used to guide budget and program decisions, and shall include—

(A) economic and technical analysis of renewable energy potential, including resource assessment;

(B) analysis of past program performance, both in terms of technical advances and in market introduction of renewable energy; and

(C) any other analysis or evaluation that the Secretary considers appropriate.

(2) Funding

The Secretary may designate up to 1 percent of the funds appropriated for carrying out this part for analysis and evaluation activities under this subsection.

(Pub. L. 109–58, title IX, §931, Aug. 8, 2005, 119 Stat. 868; Pub. L. 110–140, title II, §231, Dec. 19, 2007, 121 Stat. 1536; Pub. L. 116–260, div. Z, title III, §3006(b)(3), Dec. 27, 2020, 134 Stat. 2512.)

AMENDMENTS

2020—Subsec. (a)(2). Pub. L. 116–260, §3006(b)(3)(A)(i), (ii), redesignated subpars. (C) to (E) as (A) to (C), respectively, and struck out former subpars. (A) and (B) which related to solar and wind energy programs.

Subsecs. (d) to (g). Pub. L. 116–260, §3006(b)(3)(B), (C), redesignated subsecs. (e) to (g) as (d) to (f), respectively, and struck out former subsec. (d) which related to solar power.

2007—Subsec. (b)(4). Pub. L. 110–140, §231(1), added par. (4).

Subsec. (c)(2) to (4). Pub. L. 110–140, §231(2), in par. (2), substituted ''$377,000,000'' for ''$251,000,000'', in par. (3), substituted ''$398,000,000'' for ''$274,000,000'', and added par. (4).

EFFECTIVE DATE OF 2007 AMENDMENT

Amendment by Pub. L. 110–140 effective on the date that is 1 day after Dec. 19, 2007, see section 1601 of Pub. L. 110–140, set out as an Effective Date note under section 1824 of Title 2, The Congress.

§ 16232. Bioenergy program

(a) Definitions

In this section:

(1) Biomass

The term ''biomass'' means—

(A) any organic material grown for the purpose of being converted to energy;

(B) any organic byproduct of agriculture (including wastes from food production and processing) that can be converted into energy; or

(C) any waste material that can be converted to energy, is segregated from other waste materials, and is derived from—

(i) any of the following forest-related resources: mill residues, precommercial thinnings, slash, brush, or otherwise nonmerchantable material; or

(ii) wood waste materials, including waste pallets, crates, dunnage, manufacturing and construction wood wastes (other than pressure-treated, chemically-treated, or painted wood wastes), and landscape or right-of-way tree trimmings, but not including municipal solid waste, gas derived from the biodegradation of municipal solid waste, or paper that is commonly recycled.

(2) Lignocellulosic feedstock

The term ''lignocellulosic feedstock'' means any portion of a plant or coproduct from conversion, including crops, trees, forest residues, and agricultural residues not specifically grown for food, including from barley grain, grapeseed, rice bran, rice hulls, rice straw, soybean matter, and sugarcane bagasse.

(b) Program

The Secretary shall conduct a program of research, development, demonstration, and commercial application for bioenergy, including—

(1) biopower energy systems;

(2) biofuels;

(3) bioproducts;

(4) integrated biorefineries that may produce biopower, biofuels, and bioproducts;

(5) cross-cutting research and development in feedstocks; and

(6) economic analysis.

(c) Biofuels and bioproducts

The goals of the biofuels and bioproducts programs shall be to develop, in partnership with industry and institutions of higher education—

(1) advanced biochemical and thermochemical conversion technologies capable of making fuels from lignocellulosic feedstocks that are price-competitive with gasoline or diesel in either internal combustion engines or fuel cell-powered vehicles;

(2) advanced biotechnology processes capable of making biofuels and bioproducts with emphasis on development of biorefinery technologies using enzyme-based processing systems;

(3) advanced biotechnology processes capable of increasing energy production from lignocellulosic feedstocks, with emphasis on reducing the dependence of industry on fossil fuels in manufacturing facilities; and

(4) other advanced processes that will enable the development of cost-effective bioproducts, including biofuels.

(d) Integrated biorefinery demonstration projects

(1) In general

The Secretary shall carry out a program to demonstrate the commercial application of in-