

sumptive use of water after the technology has reached the stage of commercial application shall include thorough consideration of the impacts of such technology and use on water resources pursuant to the provisions of section 5912 of this title.

(4) Heavy emphasis shall be given to those technologies which utilize renewable or essentially inexhaustible energy sources.

(5) The potential for production of net energy by the proposed technology at the stage of commercial application shall be analyzed and considered in evaluating proposals.

(b) The Congress further directs that the execution of the comprehensive research, development, and demonstration program shall conform to the following principles:

(1) Research and development of nonnuclear energy sources shall be pursued in such a way as to facilitate the commercial availability of adequate supplies of energy to all regions of the United States.

(2) In determining the appropriateness of Federal involvement in any particular research and development undertaking, the Secretary shall give consideration to the extent to which the proposed undertaking satisfies criteria including, but not limited to, the following:

(A) The urgency of public need for the potential results of the research, development, or demonstration effort is high, and it is unlikely that similar results would be achieved in a timely manner in the absence of Federal assistance.

(B) The potential opportunities for non-Federal interests to recapture the investment in the undertaking through the normal commercial utilization of proprietary knowledge appear inadequate to encourage timely results.

(C) The extent of the problems treated and the objectives sought by the undertaking are national or widespread in their significance.

(D) There are limited opportunities to induce non-Federal support of the undertaking through regulatory actions, end use controls, tax and price incentives, public education, or other alternatives to direct Federal financial assistance.

(E) The degree of risk of loss of investment inherent in the research is high, and the availability or risk capital to the non-Federal entities which might otherwise engage in the field of the research is inadequate for the timely development of the technology.

(F) The magnitude of the investment appears to exceed the financial capabilities of potential non-Federal participants in the research to support effective efforts.

(Pub. L. 93-577, § 5, Dec. 31, 1974, 88 Stat. 1880; Pub. L. 95-91, title III, § 301(a), title VII, §§ 703, 707, Aug. 4, 1977, 91 Stat. 577, 606, 607.)

#### TRANSFER OF FUNCTIONS

“Secretary”, meaning Secretary of Energy, substituted in text for “Administrator”, meaning Administrator of Energy Research and Development Administration, pursuant to sections 301(a), 703, and 707 of Pub. L. 95-91, which are classified to sections 7151(a), 7293, and 7297 of this title and which terminated Energy Re-

search and Development Administration and transferred its functions and functions of Administrator thereof (with certain exceptions) to Secretary of Energy.

#### NATIONAL ALCOHOL FUELS COMMISSION

Pub. L. 95-599, title I, § 170, Nov. 6, 1978, 92 Stat. 2724, as amended by Pub. L. 96-106, § 20, Nov. 9, 1979, 93 Stat. 799, established the National Alcohol Fuels Commission, directed the Commission to make a full and complete investigation and study of the long- and short-term potential for alcohol fuels, from biomass (including but not limited to, animal, crop and wood waste, municipal and industrial waste, sewage sludge, and ocean and terrestrial crops) and coal, to contribute to meeting the Nation's energy needs, and provided that, not later than eighteen months after being established, the Commission submit to the President and the Congress its final report including its recommendations and findings, with the Commission to cease to exist six months after submission of such report.

#### § 5905. Comprehensive planning and programming

(a) Pursuant to the authority and directions of this chapter and the Energy Reorganization Act of 1974 (Public Law 93-438) [42 U.S.C. 5801 et seq.], the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), and titles XX through XXIII of the Energy Policy Act of 1992 [42 U.S.C. 13401 et seq., 13451 et seq., 13501 et seq., 13521 et seq.], the Secretary, in consultation with the Advisory Board established under section 2302 of the Energy Policy Act of 1992 [42 U.S.C. 13522], shall transmit to the Congress, on or before June 30, 1975, a comprehensive plan for energy research, development, and demonstration. This plan shall be appropriately revised annually as provided in section 5914(a)<sup>1</sup> of this title. Such plan shall be designed to achieve—

(1) solutions to immediate and short-term (the period up to 5 years after submission of the plan or its annual revision) energy supply system and associated environmental problems;

(2) solutions to middle-term (the period from 5 years to 10 years after submission of the plan or its annual revision) energy supply system and associated environmental problems; and

(3) solutions to long-term (the period beyond 10 years after submission of the plan or its annual revision) energy supply system and associated environmental problems.

(b)(1) Based on the comprehensive energy research, development, and demonstration plan developed under subsection (a), the Secretary, in consultation with the Advisory Board established under section 2302 of the Energy Policy Act of 1992 [42 U.S.C. 13522], shall develop and transmit to the Congress, on or before June 30, 1975, a comprehensive nonnuclear energy research, development, and demonstration program to implement the nonnuclear research, development, and demonstration aspects of the comprehensive plan. Such program shall be updated and transmitted to the Congress annually as part of the report required under section 5914<sup>1</sup> of this title.

(2) This program shall be designed to achieve solutions to the energy supply and associated

<sup>1</sup> See References in Text note below.

environmental problems in the immediate and short-term, middle-term, and long-term time intervals described in subsection (a)(1) through (3). In formulating the nonnuclear aspects of this program, the Secretary, in consultation with the Advisory Board established under section 2302 of the Energy Policy Act of 1992 [42 U.S.C. 13522], shall evaluate the economic, environmental, and technological merits of each aspect of the program.

(3) The Secretary shall assign program elements and activities in specific nonnuclear energy technologies, to the short-term, middle-term, and long-term time intervals, and shall present full and complete justification for these assignments and the degree of emphasis for each. These program elements and activities shall include, but not be limited to, research, development, and demonstrations designed—

(A) to advance energy conservation technologies, including but not limited to—

(i) productive use of waste, including garbage, sewage, agricultural wastes, and industrial waste heat;

(ii) reuse and recycling of materials and consumer products;

(iii) improvements in automobile design for increased efficiency and lowered emissions, including investigation of the full range of alternatives to the internal combustion engine and systems of efficient public transportation; and

(iv) advanced urban and architectural design to promote efficient energy use in the residential and commercial sectors, improvements in home design and insulation technologies, small thermal storage units and increased efficiency in electrical appliances and lighting fixtures;

(B) to accelerate the commercial demonstration of technologies for producing low-sulfur fuels suitable for boiler use;

(C) to demonstrate improved methods for the generation, storage, and transmission of electrical energy through (i) advances in gas turbine technologies, combined power cycles, the use of low British thermal unit gas and, if practicable, magnetohydrodynamics; (ii) storage systems to allow more efficient load following, including the use of inertial energy storage systems; and (iii) improvement in cryogenic transmission methods;

(D) to accelerate the commercial demonstration of technologies for producing substitutes for natural gas, including coal gasification: *Provided*, That the Secretary shall invite and consider proposals from potential participants based upon Federal assistance and participation in the form of a joint Federal-industry corporation, and recommendations pursuant to this clause shall be accompanied by a report on the viability of using this form of Federal assistance or participation;

(E) to accelerate the commercial demonstration of technologies for producing syn crude and liquid petroleum products from coal: *Provided*, That the Secretary shall invite and consider proposals from potential participants based upon Federal assistance and participation through guaranteed prices or purchase of the products, and recommendations pursuant

to this clause shall be accompanied by a report on the viability of using this form of Federal assistance or participation;

(F) in accordance with the program authorized by the Geothermal Energy Research, Development, and Demonstration Act of 1974 (Public Law 93-410) [30 U.S.C. 1101 et seq.], to accelerate the commercial demonstration of geothermal energy technologies;

(G) to demonstrate the production of syn crude from oil shale by all promising technologies including in situ technologies;

(H) to demonstrate new and improved methods for the extraction of petroleum resources, including secondary and tertiary recovery of crude oil;

(I) to demonstrate the economics and commercial viability of solar energy for residential and commercial energy supply applications in accordance with the program authorized by the Solar Heating and Cooling Demonstration Act of 1974 (Public Law 93-409) [42 U.S.C. 5501 et seq.];

(J) to accelerate the commercial demonstration of environmental control systems for energy technologies developed pursuant to this chapter;

(K) to investigate the technical and economic feasibility of tidal power for supplying electrical energy;

(L) to commercially demonstrate advanced solar energy technologies in accordance with the Solar Energy Research, Development, and Demonstration Act of 1974 (Public Law 93-473) [42 U.S.C. 5551 et seq.];

(M) to determine the economics and commercial viability of the production of synthetic fuels such as hydrogen and methanol;

(N) to commercially demonstrate the use of fuel cells for central station electric power generation;

(O) to determine the economics and commercial viability of in situ coal gasification;

(P) to improve techniques for the management of existing energy systems by means of quality control; application of systems analysis, communications, and computer techniques; and public information with the objective of improving the reliability and efficiency of energy supplies and encourage the conservation of energy resources;

(Q) to improve methods for the prevention and cleanup of marine oil spills;

(R) to implement the Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (42 U.S.C. 12001 et seq.); and

(S) to implement titles XX through XXIII of the Energy Policy Act of 1992 [42 U.S.C. 13401 et seq., 13451 et seq., 13501 et seq., 13521 et seq.].

(c) Based upon the comprehensive plan developed under subsection (a), the Secretary, in consultation with the Advisory Board established under section 2302 of the Energy Policy Act of 1992 [42 U.S.C. 13522], shall develop and transmit to the Congress, on or before September 1, 1978, a comprehensive environment and safety program to insure the full consideration and evaluation of all environmental, health, and safety impacts of each element, program, or initiative contained in the nuclear and nonnuclear energy research, development, and demonstration

plans. Such program shall be updated and transmitted to the Congress annually as part of the report required under section 5914<sup>1</sup> of this title.

(Pub. L. 93-577, §6, Dec. 31, 1974, 88 Stat. 1881; Pub. L. 95-238, title II, §206(a), Feb. 25, 1978, 92 Stat. 61; Pub. L. 102-486, title XXIII, §2303(a), Oct. 24, 1992, 106 Stat. 3092; Pub. L. 109-58, title X, §1009(b)(4), Aug. 8, 2005, 119 Stat. 935.)

#### REFERENCES IN TEXT

The Energy Reorganization Act of 1974, referred to in subsec. (a), is Pub. L. 93-438, Oct. 11, 1974, 88 Stat. 1233, as amended, which is classified principally to chapter 73 (§5801 et seq.) of this title. For complete classification of this Act to the Code, see Short Title note set out under section 5801 of this title and Tables.

The Department of Energy Organization Act, referred to in subsec. (a), is Pub. L. 95-91, Aug. 4, 1977, 91 Stat. 565, as amended, which is classified principally to chapter 84 (§7101 et seq.) of this title. For complete classification of this Act to the Code, see Short Title note set out under section 7101 of this title and Tables.

The Energy Policy Act of 1992, referred to in subsecs. (a) and (b)(3)(S), is Pub. L. 102-486, Oct. 24, 1992, 106 Stat. 2776. Titles XX through XXIII of the Act are classified generally to subchapters VIII (§13401 et seq.), IX (§13451 et seq.), X (§13501 et seq.), and XI (§13521 et seq.), respectively, of chapter 134 of this title. For complete classification of this Act to the Code, see Short Title note set out under section 13201 of this title and Tables.

Section 5914 of this title, referred to in subsecs. (a), (b)(1), and (c), was omitted from the Code.

The Geothermal Energy Research, Development, and Demonstration Act of 1974, referred to in subsec. (b)(3)(F), is Pub. L. 93-410, Sept. 3, 1974, 88 Stat. 1079, as amended, which is classified generally to chapter 24 (§1101 et seq.) of Title 30, Mineral Lands and Mining. For complete classification of this Act to the Code, see Short Title note set out under section 1101 of Title 30 and Tables.

The Solar Heating and Cooling Demonstration Act of 1974, referred to in subsec. (b)(3)(I), is Pub. L. 93-409, Sept. 3, 1974, 88 Stat. 1069, as amended, which is classified generally to subchapter I (§5501 et seq.) of chapter 71 of this title. For complete classification of this Act to the Code, see Short Title note set out under section 5501 of this title and Tables.

The Solar Energy Research, Development, and Demonstration Act of 1974, referred to in subsec. (b)(3)(L), is Pub. L. 93-473, Oct. 26, 1974, 88 Stat. 1431, as amended, which is classified generally to subchapter II (§5551 et seq.) of chapter 71 of this title. For complete classification of this Act to the Code, see Short Title note set out under section 5551 of this title and Tables.

The Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989, referred to in subsec. (b)(3)(R), is Pub. L. 101-218, Dec. 11, 1989, 103 Stat. 1859, which is classified principally to chapter 125 (§12001 et seq.) of this title. For complete classification of this Act to the Code, see Short Title note set out under section 12001 of this title and Tables.

#### AMENDMENTS

2005—Subsec. (b)(3). Pub. L. 109-58 substituted “Secretary” for “Administrator” in introductory provisions and subpars. (D) and (E) and inserted “Demonstration” after “Cooling” in subpar. (I) and “Energy” after “Solar” in subpar. (L).

1992—Subsec. (a). Pub. L. 102-486, §2303(a)(1)(A), substituted “the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), and titles XX through XXIII of the Energy Policy Act of 1992, the Secretary, in consultation with the Advisory Board established under section 2302 of the Energy Policy Act of 1992,” for “the Administrator”.

Subsec. (a)(1). Pub. L. 102-486, §2303(a)(1)(B), substituted “(the period up to 5 years after submission of the plan or its annual revision)” for “(to the early 1980’s)”.

Subsec. (a)(2). Pub. L. 102-486, §2303(a)(1)(C), substituted “(the period from 5 years to 10 years after submission of the plan or its annual revision)” for “(the early 1980’s to 2000)”.

Subsec. (a)(3). Pub. L. 102-486, §2303(a)(1)(D), substituted “(the period beyond 10 years after submission of the plan or its annual revision)” for “(beyond 2000)”.

Subsec. (b)(1). Pub. L. 102-486, §2303(a)(2)(B), inserted at end “Such program shall be updated and transmitted to the Congress annually as part of the report required under section 5914 of this title.”

Pub. L. 102-486, §2303(a)(2)(A), substituted “Secretary, in consultation with the Advisory Board established under section 2302 of the Energy Policy Act of 1992,” for “Administrator”.

Subsec. (b)(2). Pub. L. 102-486, §2303(a)(2)(C), substituted “, middle-term, and long-term time intervals described in subsection (a)(1) through (3)” for “(to the early 1980’s), middle-term (the early 1980’s to 2000), and long-term (beyond 2000) time intervals”.

Pub. L. 102-486, §2303(a)(2)(A), substituted “Secretary, in consultation with the Advisory Board established under section 2302 of the Energy Policy Act of 1992,” for “Administrator”.

Subsec. (b)(3). Pub. L. 102-486, §2303(a)(2)(D)–(F), added subpars. (R) and (S).

Subsec. (c). Pub. L. 102-486, §2303(a)(3)(B), inserted at end “Such program shall be updated and transmitted to the Congress annually as part of the report required under section 5914 of this title.”

Pub. L. 102-486, §2303(a)(3)(A), substituted “Secretary, in consultation with the Advisory Board established under section 2302 of the Energy Policy Act of 1992,” for “Administrator”.

1978—Subsec. (c). Pub. L. 95-238 added subsec. (c).

NONAPPLICABILITY OF TITLE II OF PUB. L. 95-238 TO ANY AUTHORIZATION OR APPROPRIATION FOR MILITARY APPLICATION OF NUCLEAR ENERGY, ETC.; DEFINITIONS

Nonapplicability of provisions of title II of Pub. L. 95-238 with respect to any authorization or appropriation for any military application of nuclear energy, etc., see section 209 of Pub. L. 95-238, set out as a note under section 5821 of this title.

## § 5906. Federal assistance and participation in programs

### (a) Forms of activities authorized

In carrying out the objectives of this chapter, the Secretary may utilize various forms of Federal assistance and participation which may include but are not limited to—

(1) joint Federal-industry experimental, demonstration, or commercial corporations consistent with the provisions of subsection (b) of this section;

(2) contractual arrangements with non-Federal participants including corporations, consortia, universities, governmental entities and nonprofit institutions;

(3) contracts for the construction and operation of federally owned facilities;

(4) Federal purchases or guaranteed price of the products of demonstration plants or activities consistent with the provisions of subsection (c) of this section;

(5) Federal loans to non-Federal entities conducting demonstrations of new technologies;

(6) incentives, including financial awards, to individual inventors, such incentives to be designed to encourage the participation of a large number of such inventors; and