Public Law 95-590
95th Congress

An Act

Nov. 4, 1978
[H.R. 12874]

To provide for an accelerated program of research, development, and demonstration of solar photovoltaic energy technologies leading to early competitive commercial applicability of such technologies to be carried out by the Department of Energy, with the support of the National Aeronautics and Space Administration, the National Bureau of Standards, the General Services Administration, and other Federal agencies.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978".

Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978.
42 USC 5501 note.

FINDINGS AND POLICY

42 USC 5581.

SEC. 2. (a) The Congress hereby finds that—

(1) the United States of America is faced with a finite and diminishing resource base of native fossil fuels, and as a consequence must develop as quickly as possible a diversified, pluralistic national energy capability and posture;

(2) the current imbalance between supply and demand for fuels and energy in the United States is likely to grow for many years;

(3) the early demonstration of the feasibility of using solar photovoltaic energy systems for the generation of electricity could help to relieve the demand on existing fuel and energy supplies;

(4) the national security and economic well-being of the United States is endangered by its dependence on imported energy supplies which are subject to resource limitations, artificial pricing mechanisms which do not accurately reflect supply and demand relationships, and supply interruptions;

(5) the early development and widespread utilization of photovoltaic energy systems could significantly expand the domestic energy resource base of the United States, thereby lessening its dependence on foreign supplies;

(6) the establishment of sizable markets for photovoltaic energy systems will justify private investment in plant and equipment necessary to realize the economies of scale, and will result in significant reductions in the unit costs of these systems;

(7) the use of solar photovoltaic energy systems for certain limited applications has already proved feasible;

(8) there appear to be no insoluble technical obstacles to the widespread commercial use of solar photovoltaic energy technologies;

(9) an aggressive research and development program should solve existing technical problems of solar photovoltaic systems; and, supported by an assured and growing market for photovoltaic systems during the next decade, should maximize the future contribution of solar photovoltaic energy to this Nation's future energy production;

(10) it is the proper and appropriate role of the Federal Government to undertake research, development, and demonstration programs in solar photovoltaic energy technologies and to supple-

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ment and assist private industry and other entities and thereby the general public, so as to hasten the general commercial use of such technologies;

(11) the high cost of imported energy sources impairs the economic growth of many nations which lack sizable domestic energy supplies or are unable to develop these resources;

(12) photovoltaic energy systems are economically competitive with conventional energy resources for a wide variety of applications in many foreign nations at the present time, and will find additional applications with continued cost reductions;

(13) the early development and export of solar photovoltaic energy systems, consistent with the established preeminence of the United States in the field of high technology products, can make a valuable contribution to the well-being of the people of other nations and to this Nation's balance of trade;

(14) the widespread use of solar photovoltaic energy systems to supplement and replace conventional methods for the generation of electricity would have a beneficial effect upon the environment;

(15) to increase the potential application of solar photovoltaic energy systems in remote locations, and to minimize the need for backup systems depending on fossil fuel, programs leading to the development of inexpensive and reliable systems for the storage of electricity should be pursued as part of any solar photovoltaic energy research, development, and demonstration program;

(16) evaluation of the performance and reliability of solar photovoltaic energy technologies can be expedited by testing of prototypes under carefully controlled conditions;

(17) commercial application of solar photovoltaic energy technologies can be expedited by early commercial demonstration under practical conditions;

(18) photovoltaic energy systems are currently adaptable on a life cycle, cost-justified basis for certain of the energy needs of the Federal Government, and will find additional applications as continued refinements improve performance and reduce unit costs;

(19) the Federal Government can stimulate innovation and economic efficiency in the production of photovoltaic energy systems through the development and implementation of policies to promote diversity and maximum competition between firms engaged in the research, manufacture, installation, and/or maintenance of these systems;

(20) innovation and creativity in the development of solar photovoltaic energy components and systems can be fostered through encouraging direct contact between the manufacturers of such systems and the architects, engineers, developers, contractors, and other persons interested in utilizing such systems; and

(21) it is contemplated that the ten-year program established by this Act will require the expenditure of $1,500,000,000 by the Federal Government.

(b) It is therefore declared to be the policy of the United States and the purpose of this Act to establish during the next decade an aggressive research, development, and demonstration program involving solar photovoltaic energy systems and in the long term, to have as an objective the production of electricity from photovoltaic systems cost competitive with utility-generated electricity from conventional sources. Further, it is declared to be the policy of the United States and

the purpose of this Act that the objectives of this research, development, and demonstration program are—

(1) to double the production of solar photovoltaic energy systems each year during the decade starting with fiscal year 1979, measured by the peak generating capacity of the systems produced, so as to reach a total annual United States production of solar photovoltaic energy systems of approximately two million peak kilowatts, and a total cumulative production of such systems of approximately four million peak kilowatts by fiscal year 1988;

(2) to reduce the average cost of installed solar photovoltaic energy systems to $1 per peak watt by fiscal year 1988; and

(3) to stimulate the purchase by private buyers of at least 90 per centum of all solar photovoltaic energy systems produced in the United States during fiscal year 1988.

DEFINITIONS

42 USC 5582.

SEC. 3. For purposes of this Act—

(1) a "solar photovoltaic energy system" is a system of components which generates electricity from incident sunlight by means of the photovoltaic effect, and which shall include all components, including energy storage devices where appropriate, necessary to provide electricity for individual, industrial, agricultural, or governmental use;

(2) the term "solar photovoltaic energy system" may be used interchangeably with the term "photovoltaic system";

(3) a "hybrid solar photovoltaic energy system" is a system of components that generates electricity from incident sunlight by means of the photovoltaic effect and, in conjunction with electronic and, if appropriate, optical, thermal and storage devices, provides electricity, as well as heat and/or light for individual, commercial, industrial, agricultural, or governmental use:

(4) "photovoltaic effect" refers to the physical phenomenon exhibited under certain circumstances by some materials in which a portion of the light energy striking the material is directly converted to electrical energy;

(5) "facility" means any building, agricultural, commercial or industrial complex or other device constructively employing photovoltaic systems; and

(6) "Secretary" means the Secretary of Energy.

RESEARCH, DEVELOPMENT, AND DEMONSTRATION OF SOLAR PHOTOVOLTAIC ENERGY SYSTEMS

Programs, establishment. 42 USC 5583.

SEC. 4. The Secretary is directed to establish immediately and carry forth such research, development, and demonstration programs as may be necessary to meet the objectives of this Act as set forth in section 2(b), and as a part of any such program shall—

(a) conduct, and promote the coordination and acceleration of, research, development, and demonstrations relating to solar photovoltaic energy systems and components thereof, and

(b) conduct, and promote the coordination and acceleration of, research, development, and demonstrations for systems and components to be used in applications that are dependent for their energy on solar photovoltaic energy systems.

42 USC 5584.

Federal assistance application procedures. Agreements.

SEC. 5. (a) In carrying out the provisions of section (4), the Secretary is authorized—

(1) to establish procedures whereby any public or private entity wishing to install solar photovoltaic components and systems in any new or existing facility may apply for Federal assistance in purchasing and installing, in such facility, photovoltaic components or systems;

(2) to select, as soon as he deems it feasible, a number of the applicants under paragraph (1) and enter into agreements with them for the design, purchase, fabrication, testing, installation, and demonstration of photovoltaic components and systems. Such selection shall be based on the need to obtain scientific, technological, and economic information from a variety of such systems under a variety of circumstances and conditions; and

(3) to arrange, as part of any agreement entered into under paragraph (2), to provide up to 75 per centum of the purchase and installation costs of photovoltaic components or systems, taking into account relevant considerations involving the relative stage of consumer and industry interest and development at the time of the financial assistance action. Such arrangements shall be contingent upon terms and conditions prescribed by the Secretary, including an express agreement that the entity with whom the agreement is entered into shall, in such manner and form and on such terms and conditions as the Secretary may prescribe, observe and monitor (or permit the Secretary or his agents to observe and monitor) the performance and operation of such system for a period of five years, and that such entity (including any subsequent owner of the property) shall regularly furnish the Secretary with such reports thereon as the agreement may require.

Observation and monitoring reports.

(b) The Secretary shall, as he deems appropriate, undertake any projects or activities (including demonstration projects) to further the attainment of the objectives of this section.

42 USC 5585.

SEC. 6. (a) The Secretary is authorized to select on the basis of open competitions—

(1) a number of readily available photovoltaic components and systems;

(2) a number of design concepts for various types of applications which demonstrate adapability to the utilization of photovoltaic components and systems; and

(3) a number of designs for applications selected under paragraph (2), so that each design includes specific provisions for the utilization of solar photovoltaic components and systems selected under paragraph (1).

(b) The Secretary, in accordance with the applicable provisions of sections 7, 8, and 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5901 et seq.) and with such program guidelines as the Secretary may establish, shall—

42 USC 5906, 5907, 5908.

Contracts and grants.

(1) enter into such contracts and grants as may be necessary or appropriate for the development for commercial production and utilization of photovoltaic components and systems, including any further planning and design which may be required to conform with the specifications set forth in any applicable criteria;

(2) select, as being compatible with the design concepts chosen under subsection (a)(2) of this section, a reasonable number of photovoltaic components and systems; and

(3) enter into contracts with a number of persons or firms for the procurement of photovoltaic components and systems, including adequate numbers of spare and replacement parts for such systems.

Contracts.

(c) The Secretary is authorized to award contracts for the design integration between the application concepts and the photovoltaic systems procured by the Secretary under subsection (b)(3), and for the demonstration of prototype solar photovoltaic systems, and, when appropriate, for the utilization of such systems in existing facilities. Title to and ownership of the facilities so constructed and of photovoltaic systems installed hereunder may be conveyed to purchasers of such facilities under terms and conditions prescribed by the Secretary, including an express agreement that any such purchaser shall, in such manner and form and on such terms and conditions as the Secretary may prescribe, observe and monitor (or permit the Secretary to observe and monitor) the performance and operation of such systems for a period of five years, and that such purchaser (including any subsequent owner) shall regularly furnish the Secretary with such reports thereon as the agreement may require.

Title, conveyance.
Observation and monitoring reports.

(d) The Secretary, in consultation with the Administrator of General Services or the Secretary of Defense or both (as may be appropriate) shall enter into arrangements with appropriate Federal agencies concurrently with the conduct of the programs under this section and section 7 of this Act, to carry out such projects and activities (including demonstration projects), with respect to Federal buildings and facilities, as may be appropriate for the demonstration of photovoltaic systems suitable and effective for use in such applications.

Federal agencies cooperation, consultation.

(e) The Secretary shall, as he deems appropriate, undertake any projects or activities (including demonstration projects) to further the attainment of the objectives of this section.

TEST PROCEDURES AND PERFORMANCE CRITERIA

SEC. 7. (a) The Secretary shall conduct a testing program for photovoltaic systems to assist in the development and demonstration of prototype photovoltaic systems, including collectors, controls, power conditioning, and energy storage systems.

Program.
42 USC 5586.

(b) Data obtained from the testing program under subsection (a) shall be evaluated and used in establishing performance criteria. These performance criteria shall be used in the demonstration program described in sections 4, 5, and 6 of this Act.

(c) The Secretary shall determine, prescribe, and publish in the Federal Register, at a time which he determines to be feasible and justified—

Publication in Federal Register.

(1) performance criteria for photovoltaic components and systems to be used in appropriate applications, and procedures whereby manufacturers of photovoltaic components and systems shall have their products tested in order to provide certification that such products conform to the performance criteria established under this paragraph; and

(2) revised performance criteria for photovoltaic components and systems to be used in appropriate applications, and procedures whereby manufacturers of photovoltaic components and systems shall have their products tested in order to provide certification that such products conform to the performance criteria established under this paragraph. Such criteria may be annually revised by the Secretary, as he deems appropriate.

(d) Any photovoltaic component or system procured or installed by the Federal Government or procured or installed with Federal assistance under section (5) or section (6) shall meet appropriate performance criteria prescribed under this section, if such performance criteria have been prescribed.

COORDINATION MONITORING, AND LIAISON

42 USC 5587.

SEC. 8. (a) The Secretary, in coordination with such Government agencies as may be appropriate, shall—

(1) monitor the performance and operation of photovoltaic systems installed under this Act;

(2) collect and evaluate data and information on the performance and operation of photovoltaic systems installed under this Act; and

(3) from time to time carry out such studies and investigations and take such other actions, including the submission of special reports to the Congress when appropriate, as may be necessary to assure that the programs for which the Secretary is responsible under this Act effectively carry out the policy of this Act.

(b) In the development of the performance criteria and test procedures required under section 7 of this Act, the Secretary shall work closely with the appropriate scientific, technical, and professional societies and industry representatives in order to assure the best possible use of available expertise in this area.

(c) The Secretary shall also maintain continuing liaison with related industries and interests, and with the scientific and technical community, during and after the period of the programs carried out under this Act, in order to assure that the projected benefits of such programs are and will continue to be realized.

SOLAR PHOTOVOLTAIC ENERGY ADVISORY COMMITTEE

Establishment and duties.
42 USC 5588.

SEC. 9. (a) There is hereby established a Solar Photovoltaic Energy Advisory Committee, which shall study and advise the Secretary on—

(1) the scope and pace of research and development with respect to solar photovoltaic energy systems;

(2) the need for and timing of solar photovoltaic energy systems demonstration projects;

(3) the need for change in any research, development, or demonstration program established under this Act; and

(4) the economic, technological, and environmental consequences of the use of solar photovoltaic energy systems.

Membership.

(b) The Committee shall be composed of thirteen members, including eleven members appointed by the Secretary from industrial organizations, academic institutions, professional societies or institutions, and other sources as he sees fit, and two members of the public appointed by the President. The Chairman of the Committee shall be elected from among the members thereof.

(c) The heads of the departments, agencies, and instrumentalities of the executive branch of the Federal Government shall cooperate with the Committee in carrying out the requirements of this section, and shall furnish to the Committee such information as the Committee deems necessary to carry out this section.

(d) Section 624 of the Department of Energy Organization Act shall be applicable to the Committee, except as inconsistent with this section. 42 USC 7234.

DISSEMINATION OF INFORMATION AND OTHER ACTIVITIES TO PROMOTE PRACTICAL USE OF SOLAR PHOTOVOLTAIC TECHNOLOGIES

SEC. 10 (a) The Secretary shall take all possible steps to assure that full and complete information with respect to the demonstrations and other activities conducted under this Act is made available to Federal, State, and local authorities, relevant segments of the economy, the scientific and technical community, and the public at large, both during and after the close of the programs under this Act, with the objective of promoting and facilitating to the maximum extent feasible the early and widespread practical use of photovoltaic energy throughout the United States. Any trade secret or other proprietary information shall be exempted from such mandatory disclosure, as otherwise specified in law applicable to research, development and demonstration programs of the Department of Energy, including, but not limited to, section 17 of the Federal Non-Nuclear Energy Research and Development Act of 1974, Public Law 93-577, as amended. 42 USC 5589. 42 USC 5916.

(b) The Secretary shall— Studies and investigation.

(1) study the effect of the widespread utilization of photovoltaic systems on the existing electric utility system at varying levels of photovoltaic contribution to the system;

(2) study and investigate the effect of utility rate structures, building codes, zoning ordinances, and other laws, codes, ordinances, and practices upon the practical use of photovoltaic systems;

(3) determine the extent to which such laws, codes, ordinances, and practices should be changed to permit or facilitate such use and the methods by which any such changes may best be accomplished; and

(4) determine the necessity of a program of incentives to accelerate the commercial application of photovoltaic technologies.

(c) The Secretary is authorized and directed, within one year of the date of enactment of this Act, to make recommendations to the President and to the Congress for Federal policies relating to barriers to the early and widespread utilization of photovoltaic systems in order to realize the goals set forth in section 2. These recommendations shall include but not be limited to— Policy recommendations to the President and Congress.

(1) the potential for integration of electricity derived from photovoltaic energy systems into the existing national grid system, including the potential of photovoltaic-generated electricity to meet the peak-load energy needs of electric utilities, load management and reliability implications of the utilization of photovoltaic electricity by utilities, the implications of utility ownership of photovoltaic components leased to others primarily for decentralized applications, the impacts of utility use of electricity derived from photovoltaic energy systems on utility rate structures, and the potential for reducing or obviating the need for energy storage components for photovoltaic energy systems through utility interface;

(2) the extent of competition between firms currently engaged in the fabrication and installation of photovoltaics components and systems as it affects the character and growth potential of the American photovoltaics industry, and the likelihood that small photovoltaic firms will have reasonable opportunities to compete and participate in the various programs authorized by this Act;

(3) the need to identify legal alternatives to ensure access to direct sunlight for photovoltaic energy systems, the appropriate methods of encouraging the adoption of such alternatives, and the implications of widespread utilization of photovoltaic energy systems for land use and urban development;

(4) the availability of private capital at reasonable interest rates for individuals, businesses and others desiring to establish commercial enterprises to manufacture, market, install, and/or, maintain photovoltaic components and systems, or purchase and install such systems for private, industrial, agricultural, commercial or other uses;

(5) the need for industry-wide warranty and reliability standards for photovoltaic energy components and systems for private sector applications, and, if appropriate, the mechanisms for establishing such standards; and

(6) the attainability of the goals specified in subsection 2(b), and any modification of such goals which the Secretary proposes for consideration by Congress, with supporting analyses.

Consultation and coordination.

(d) In carrying out his functions under this section, the Secretary shall consult with the appropriate government agencies, industry representatives, and members of the scientific and technical community having expertise and interest in this area. The Secretary also shall ensure that any study or report prepared pursuant to this section is fully coordinated with and reflective of any analyses or reports prepared pursuant to the requirements in section 208 of the Department of Energy Act of 1978—Civilian Applications, Public Law 95-238, and in the President's Solar Energy Domestic Policy Review. The Secretary, as appropriate, may merge any continuing or on-going studies under section 208 or the Domestic Policy Review with those required by this section or avoid any unnecessary duplication of effort or funding. The separate report requirements of section 208 and this section, however, shall remain in force.

42 USC 5556a.

INTERNATIONAL PARTICIPATION AND COOPERATION

Plan, consultation and submittal to congressional committees. 42 USC 5590.

SEC. 11. (a) Within one year after the date of the enactment of this Act, the Secretary, in consultation with the Secretary of State, the Administrator of the Agency for International Development, the Director of ACTION, the Director of the Export/Import Bank and other appropriate Federal officials, shall submit to the House Committee on Science and Technology and the Senate Committee on Energy and Natural Resources a plan for demonstrating applications of solar photovoltaic energy systems and facilitating their widespread use in other nations, especially those with agreements for scientific cooperation with the United States.

(b) The Secretary is authorized to encourage, to the maximum extent practicable, international participation and cooperation in the

development and maintenance of programs established under this plan. The Secretary, in consultation and cooperation with the Federal officials specified in subsection (a), shall insure to the maximum extent possible that the plan submitted under subsection (a) and any other international activities under this section are consistent with and reflective of any similar activities or requirements under any other Federal statute, specifically including any of the several programs under other agencies and Departments involving United States international cooperation and assistance in nonnuclear energy technology, and will not duplicate activities under such programs. The plan required in subsection (a) shall specifically identify all such programs and statutes and describe how the activities under this section will be consistent with such programs, will be coordinated with them, and will avoid duplication of activities under such programs.

ENCOURAGEMENT AND PROTECTION OF SMALL BUSINESS

SEC. 12. In carrying out his functions under this Act, the Secretary shall take steps to assure that small-business concerns will have realistic and adequate opportunities to participate in the programs under this Act to the maximum extent practicable, and the Secretary is directed to set aside at least 10 per centum of the funds authorized and appropriated for the participation of small business concerns.

Funds set aside.
42 USC 5591.

PRIORITIES

SEC. 13. The Secretary shall set priorities, as far as possible consistent with the intent and operation of this Act, in accordance with the following criteria:

42 USC 5592.

(1) The applications utilizing photovoltaic systems which will be part of the research, development, and demonstration program and testing and demonstration programs referred to in sections 4, 5, 6, and 7 shall be located in a sufficient number of different geographic areas in the United States to assure a realistic and effective demonstration of the use of photovoltaic systems and of the applications themselves, in both rural and urban locations and under climatic conditions which vary as much as possible.

(2) The projected costs of commercial production and maintenance of the photovoltaic systems utilized in the testing and demonstration programs established under this Act should be taken into account.

(3) Encouragement should be given in the conduct of programs under this Act to those projects in which funds are appropriated by any State or political subdivision thereof for the purpose of sharing costs with the Federal Government for the purchase and installation of photovoltaic components and systems.

SEC. 14. Nothing in this Act shall be construed to negate, duplicate, or otherwise affect the provisions of title V (Federal Initiatives), part 4 (Federal Photovoltaic Utilization), National Energy Conservation Policy Act, H.R. 5037, 95th Congress, if and when that Act becomes enacted by the Ninety-fifth Congress, and such part 4 shall be exempted fully from the provisions of this Act and any regulations, guidelines, or criteria pursuant thereto.

42 USC 5593.

Post, p. 3280.

AUTHORIZATION OF APPROPRIATIONS

42 USC 5594.

SEC. 15. There is hereby authorized to be appropriated to the Secretary, for the fiscal year ending September 30, 1979, $125,000,000, inclusive of any funds otherwise authorized for photovoltaic programs, (1) to carry out the functions vested in the Secretary by this Act, (2) to carry out the functions in fiscal year 1979, vested in the Secretary by part 4 of title V of H.R. 5037, 95th Congress, if enacted by the 95th Congress, and (3) for transfer to such other agencies of the Federal Government as may be required to enable them to carry out their respective functions under this Act. Funds appropriated pursuant to this section shall remain available until expended: *Provided*, That any contract or agreement entered into pursuant to this Act shall be effective only to such extent or in such amounts as are provided in advance in appropriation Acts. Authorizations of appropriations for fiscal years after fiscal year 1979 shall be contained in the annual authorization for the Department of Energy, except for those funds authorized for fiscal years 1980 and 1981 contained in part 4 of title V of H.R. 5037, Ninety-fifth Congress, if enacted by the Ninety-fifth Congress.

Approved November 4, 1978.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 95-1285 (Comm. on Science and Technology).
SENATE REPORT No. 95-1262, accompanying S. 3392 (Comm. on Energy and Natural Resources).
CONGRESSIONAL RECORD, Vol. 124 (1978):
June 28, considered and passed House.
Oct. 10, considered and passed Senate, amended, in lieu of S. 3392.
Oct. 13, House concurred in Senate amendment.
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 14, No. 45:
Nov. 4, Presidential statement.