

Union Calendar No. 190

110TH CONGRESS
1ST SESSION

H. R. 2774

[Report No. 110-303]

To support the research, development, and commercial application of solar energy technologies, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JUNE 19, 2007

Ms. GIFFORDS introduced the following bill; which was referred to the Committee on Science and Technology

AUGUST 3, 2007

Additional sponsors: Mr. MITCHELL, Mr. ROHRABACHER, Ms. EDDIE BERNICE JOHNSON of Texas, Mr. DAVIS of Illinois, Mr. BARTLETT of Maryland, Mr. COHEN, Mr. COSTA, Mr. HINCHEY, Ms. BORDALLO, Mr. INSLEE, Mr. DONNELLY, Ms. LINDA T. SÁNCHEZ of California, Mr. REYES, Mr. HONDA, Mr. ABERCROMBIE, Mr. GRIJALVA, Mr. LANTOS, Mr. LAMPSON, and Mr. SMITH of Texas

AUGUST 3, 2007

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in *italic*]

A BILL

To support the research, development, and commercial application of solar energy technologies, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Solar Energy Research
5 and Advancement Act of 2007”.

6 **SEC. 2. DEFINITIONS.**

7 For purposes of this Act:

8 (1) The term “Department” means the Depart-
9 ment of Energy.

10 (2) The term “Secretary” means the Secretary
11 of Energy.

12 **SEC. 3. THERMAL ENERGY STORAGE RESEARCH AND DE-**
13 **VELOPMENT PROGRAM.**

14 (a) ESTABLISHMENT.—The Secretary shall establish
15 a program of research and development to provide lower
16 cost and more viable thermal energy storage technologies
17 to enable the shifting of electric power loads on demand
18 and extend the operating time of concentrating solar
19 power electric generating plants.

20 (b) AUTHORIZATION OF APPROPRIATIONS.—There
21 are authorized to be appropriated to the Secretary for ear-
22 rying out this section \$5,000,000 for fiscal year 2008,
23 \$7,000,000 for fiscal year 2009, \$9,000,000 for fiscal year
24 2010, \$10,000,000 for fiscal year 2011, and \$12,000,000
25 for fiscal year 2012.

1 **SEC. 4. CONCENTRATING SOLAR POWER COMMERCIAL AP-**
2 **PLICATION STUDIES.**

3 (a) **INTEGRATION.**—The Secretary shall conduct a
4 study on methods to integrate concentrating solar power
5 into regional electricity transmission systems, and to iden-
6 tify new transmission or transmission upgrades needed to
7 bring electricity from high concentrating solar power re-
8 source areas to growing electric power load centers
9 throughout the United States. The study shall analyze and
10 assess approaches for management and integration of con-
11 centrating solar power into regional electric transmission
12 grids to improve electric reliability, to efficiently manage
13 load, and to reduce demand on the natural gas trans-
14 mission system for electric power. The Secretary shall sub-
15 mit a report to Congress on the results of this study not
16 later than 12 months after the date of enactment of this
17 Act.

18 (b) **WATER CONSUMPTION.**—Not later than 6
19 months after the date of the enactment of this Act, the
20 Secretary of Energy shall transmit to Congress a report
21 on the results of a study on methods to reduce the amount
22 of water consumed by concentrating solar power systems.

23 **SECTION 1. SHORT TITLE.**

24 *This Act may be cited as the “Solar Energy Research*
25 *and Advancement Act of 2007”.*

1 **SEC. 2. DEFINITIONS.**

2 *For purposes of this Act:*

3 (1) *The term “Department” means the Depart-*
4 *ment of Energy.*

5 (2) *The term “Secretary” means the Secretary of*
6 *Energy.*

7 **SEC. 3. THERMAL ENERGY STORAGE RESEARCH AND DE-**
8 **VELOPMENT PROGRAM.**

9 (a) *ESTABLISHMENT.—The Secretary shall establish a*
10 *program of research and development to provide lower cost*
11 *and more viable thermal energy storage technologies to en-*
12 *able the shifting of electric power loads on demand and ex-*
13 *tend the operating time of concentrating solar power electric*
14 *generating plants.*

15 (b) *AUTHORIZATION OF APPROPRIATIONS.—There are*
16 *authorized to be appropriated to the Secretary for carrying*
17 *out this section \$5,000,000 for fiscal year 2008, \$7,000,000*
18 *for fiscal year 2009, \$9,000,000 for fiscal year 2010,*
19 *\$10,000,000 for fiscal year 2011, and \$12,000,000 for fiscal*
20 *year 2012.*

21 **SEC. 4. CONCENTRATING SOLAR POWER COMMERCIAL AP-**
22 **PLICATION STUDIES.**

23 (a) *INTEGRATION.—The Secretary shall conduct a*
24 *study on methods to integrate concentrating solar power*
25 *into regional electricity transmission systems, and to iden-*
26 *tify new transmission or transmission upgrades needed to*

1 *bring electricity from high concentrating solar power re-*
2 *source areas to growing electric power load centers through-*
3 *out the United States. The study shall analyze and assess*
4 *cost-effective approaches for management and large-scale*
5 *integration of concentrating solar power into regional elec-*
6 *tric transmission grids to improve electric reliability, to ef-*
7 *ficiently manage load, and to reduce demand on the natural*
8 *gas transmission system for electric power. The Secretary*
9 *shall submit a report to Congress on the results of this study*
10 *not later than 12 months after the date of enactment of this*
11 *Act.*

12 (b) *WATER CONSUMPTION.*—*Not later than 6 months*
13 *after the date of the enactment of this Act, the Secretary*
14 *of Energy shall transmit to Congress a report on the results*
15 *of a study on methods to reduce the amount of water con-*
16 *sumed by concentrating solar power systems.*

17 **SEC. 5. SOLAR ENERGY CURRICULUM DEVELOPMENT AND**
18 **CERTIFICATION GRANTS.**

19 (a) *ESTABLISHMENT.*—*The Secretary shall establish*
20 *in the Office of Solar Energy Technologies a competitive*
21 *grant program to create and strengthen solar industry*
22 *workforce training and internship programs in installa-*
23 *tion, operation, and maintenance of solar energy products.*
24 *The goal of this program is to ensure a supply of well-*

1 *trained individuals to support the expansion of the solar*
2 *energy industry.*

3 (b) *AUTHORIZED ACTIVITIES.*—*Grant funds may be*
4 *used to support the following activities:*

5 (1) *Creation and development of a solar energy*
6 *curriculum appropriate for the local educational, en-*
7 *trepreneurial, and environmental conditions, includ-*
8 *ing curriculum for community colleges.*

9 (2) *Support of certification programs, such as*
10 *the North American Board of Certified Energy Prac-*
11 *titioners, for individual solar energy system install-*
12 *ers, instructors, and training programs.*

13 (3) *Internship programs that provide hands-on*
14 *participation by students in commercial applications.*

15 (4) *Activities required to obtain certification of*
16 *training programs and facilities by the Institute of*
17 *Sustainable Power or an equivalent industry-accepted*
18 *quality-control certification program.*

19 (5) *Incorporation of solar-specific learning mod-*
20 *ules into traditional occupational training and in-*
21 *ternship programs for construction-related trades.*

22 (6) *The purchase of equipment necessary to*
23 *carry out activities under this section.*

24 (7) *Support of programs that provide guidance*
25 *and updates to solar energy curriculum instructors.*

1 (c) *ADMINISTRATION OF GRANTS.*—Grants may be
2 awarded under this section for up to 3 years. The Secretary
3 shall award grants to ensure sufficient geographic distribu-
4 tion of training programs nationally. Grants shall only be
5 awarded for programs certified by the Institute of Sustain-
6 able Power or an equivalent industry-accepted quality-con-
7 trol certification institution, or for new and growing pro-
8 grams with a credible path to certification. Due consider-
9 ation shall be given to women, underrepresented minorities,
10 and persons with disabilities.

11 (d) *REPORT.*—The Secretary shall make public, via
12 the website of the Department or upon request, information
13 on the name and institution for all grants awarded under
14 this section, including a brief description of the project as
15 well as the grant award amount.

16 (e) *AUTHORIZATION OF APPROPRIATIONS.*—There are
17 authorized to be appropriated to the Secretary for carrying
18 out this section \$10,000,000 for each of the fiscal years 2008
19 through 2012.

20 **SEC. 6. DAYLIGHTING SYSTEMS AND DIRECT SOLAR LIGHT**
21 **PIPE TECHNOLOGY.**

22 (a) *ESTABLISHMENT.*—The Secretary shall establish a
23 program of research and development to provide assistance
24 in the demonstration and commercial application of direct
25 solar renewable energy sources to provide alternatives to

1 *traditional power generation for lighting and illumination,*
2 *including light pipe technology, and to promote greater en-*
3 *ergy conservation and improved efficiency. All direct solar*
4 *renewable energy devices supported under this program*
5 *shall have the capability to provide measurable data on the*
6 *amount of kilowatt-hours saved over the traditionally pow-*
7 *ered light sources they have replaced.*

8 **(b) REPORTING.**—*The Secretary shall transmit to Con-*
9 *gress an annual report assessing the measurable data de-*
10 *rived from each project in the direct solar renewable energy*
11 *sources program and the energy savings resulting from its*
12 *use.*

13 **(c) DEFINITIONS.**—*For purposes of this section—*

14 **(1)** *the term “direct solar renewable energy”*
15 *means energy from a device that converts sunlight*
16 *into useable light within a building, tunnel, or other*
17 *enclosed structure, replacing artificial light generated*
18 *by a light fixture and doing so without the conversion*
19 *of the sunlight into another form of energy; and*

20 **(2)** *the term “light pipe” means a device de-*
21 *signed to transport visible solar radiation from its*
22 *collection point to the interior of a building while ex-*
23 *cluding interior heat gain in the nonheating season.*

24 **(d) AUTHORIZATION OF APPROPRIATIONS.**—*There are*
25 *authorized to be appropriated to the Secretary for carrying*

1 out this section \$3,500,000 for each of the fiscal years 2008
2 through 2012.

3 **SEC. 7. SOLAR AIR CONDITIONING RESEARCH AND DEVEL-**
4 **OPMENT PROGRAM.**

5 (a) *ESTABLISHMENT.*—The Secretary shall establish a
6 research, development, and demonstration program to pro-
7 mote less costly and more reliable decentralized distributed
8 solar-powered air conditioning for individuals and busi-
9 nesses.

10 (b) *AUTHORIZED ACTIVITIES.*—Grants made available
11 under this section may be used to support the following ac-
12 tivities:

13 (1) *Advancing solar thermal collectors, including*
14 *concentrating solar thermal and electric systems, flat*
15 *plate and evacuated tube collector performance.*

16 (2) *Achieving technical and economic integration*
17 *of solar-powered distributed air-conditioning systems*
18 *with existing hot water and storage systems for resi-*
19 *dential applications.*

20 (3) *Designing and demonstrating mass manufac-*
21 *turing capability to reduce costs of modular standard-*
22 *ized solar-powered distributed air conditioning sys-*
23 *tems and components.*

24 (4) *Improving the efficiency of solar-powered dis-*
25 *tributed air-conditioning to increase the effectiveness*

1 of solar-powered absorption chillers, solar-driven com-
2 pressors and condensers, and cost-effective precooling
3 approaches.

4 (5) *Researching and comparing performance of*
5 *solar-powered distributed air conditioning systems in*
6 *different regions of the country, including potential*
7 *integration with other onsite systems, such as solar,*
8 *biogas, geothermal heat pumps, and propane assist or*
9 *combined propane fuel cells, with a goal to develop*
10 *site-specific energy production and management sys-*
11 *tems that ease fuel and peak utility loading.*

12 (c) *COST SHARING.*—*The non-Federal share of re-*
13 *search and development projects supported under this sec-*
14 *tion shall be not less than 20 percent, and for demonstration*
15 *projects shall be not less than 50 percent.*

16 (d) *AUTHORIZATION OF APPROPRIATIONS.*—*There are*
17 *authorized to be appropriated to the Secretary for carrying*
18 *out this section \$2,500,000 for each of the fiscal years 2008*
19 *through 2012.*

20 **SEC. 8. PHOTOVOLTAIC DEMONSTRATION PROGRAM.**

21 (a) *IN GENERAL.*—*The Secretary shall establish a pro-*
22 *gram of grants to States to demonstrate advanced photo-*
23 *voltaic technology.*

24 (b) *REQUIREMENTS.*—

1 (1) *ABILITY TO MEET REQUIREMENTS.*—To re-
2 ceive funding under the program under this section,
3 a State must submit a proposal that demonstrates, to
4 the satisfaction of the Secretary, that the State will
5 meet the requirements of subsection (f).

6 (2) *COMPLIANCE WITH REQUIREMENTS.*—If a
7 State has received funding under this section for the
8 preceding year, the State must demonstrate, to the
9 satisfaction of the Secretary, that it complied with the
10 requirements of subsection (f) in carrying out the pro-
11 gram during that preceding year, and that it will do
12 so in the future, before it can receive further funding
13 under this section.

14 (3) *FUNDING ALLOCATION.*—Each State submit-
15 ting a qualifying proposal shall receive funding under
16 the program based on the proportion of United States
17 population in the State according to the 2000 census.
18 In each fiscal year, the portion of funds attributable
19 under this paragraph to States that have not sub-
20 mitted qualifying proposals in the time and manner
21 specified by the Secretary shall be distributed pro
22 rata to the States that have submitted qualifying pro-
23 posals in the specified time and manner.

24 (c) *COMPETITION.*—If more than \$25,000,000 is avail-
25 able for the program under this section for any fiscal year,

1 *the Secretary shall allocate 75 percent of the total amount*
2 *of funds available according to subsection (b)(3), and shall*
3 *award the remaining 25 percent on a competitive basis to*
4 *the States with the proposals the Secretary considers most*
5 *likely to encourage the widespread adoption of photovoltaic*
6 *technologies.*

7 *(d) PROPOSALS.—Not later than 6 months after the*
8 *date of enactment of this Act, and in each subsequent fiscal*
9 *year for the life of the program, the Secretary shall solicit*
10 *proposals from the States to participate in the program*
11 *under this section.*

12 *(e) COMPETITIVE CRITERIA.—In awarding funds in a*
13 *competitive allocation under subsection (c), the Secretary*
14 *shall consider—*

15 *(1) the likelihood of a proposal to encourage the*
16 *demonstration of, or lower the costs of, advanced pho-*
17 *tovoltaic technologies; and*

18 *(2) the extent to which a proposal is likely to—*

19 *(A) maximize the amount of photovoltaics*
20 *demonstrated;*

21 *(B) maximize the proportion of non-Federal*
22 *cost share; and*

23 *(C) limit State administrative costs.*

24 *(f) STATE PROGRAM.—A program operated by a State*
25 *with funding under this section shall provide competitive*

1 *awards for the demonstration of advanced photo-voltaic*
2 *technologies. Each State program shall—*

3 *(1) require a contribution of at least 60 percent*
4 *per award from non-Federal sources, which may in-*
5 *clude any combination of State, local, and private*
6 *funds, except that at least 10 percent of the funding*
7 *must be supplied by the State;*

8 *(2) endeavor to fund recipients in the commer-*
9 *cial, industrial, institutional, governmental, and resi-*
10 *dential sectors;*

11 *(3) limit State administrative costs to no more*
12 *than 10 percent of the grant;*

13 *(4) report annually to the Secretary on—*

14 *(A) the amount of funds disbursed;*

15 *(B) the amount of photovoltaics purchased;*

16 *and*

17 *(C) the results of the monitoring under*
18 *paragraph (5);*

19 *(5) provide for measurement and verification of*
20 *the output of a representative sample of the*
21 *photovoltaics systems demonstrated throughout the av-*
22 *erage working life of the systems, or at least 20 years;*
23 *and*

24 *(6) require that applicant buildings must have*
25 *received an independent energy efficiency audit dur-*

1 *ing the 6-month period preceding the filing of the ap-*
2 *plication.*

3 *(g) UNEXPENDED FUNDS.—If a State fails to expend*
4 *any funds received under subsection (b) or (c) within 3*
5 *years of receipt, such remaining funds shall be returned to*
6 *the Treasury.*

7 *(h) REPORTS.—The Secretary shall report to Congress*
8 *5 years after funds are first distributed to the States under*
9 *this section—*

10 *(1) the amount of photovoltaics demonstrated;*

11 *(2) the number of projects undertaken;*

12 *(3) the administrative costs of the program;*

13 *(4) the amount of funds that each State has not*
14 *received because of a failure to submit a qualifying*
15 *proposal, as described in subsection (b)(3);*

16 *(5) the results of the monitoring under subsection*
17 *(f)(5); and*

18 *(6) the total amount of funds distributed, includ-*
19 *ing a breakdown by State.*

20 *(i) AUTHORIZATION OF APPROPRIATIONS.—There are*
21 *authorized to be appropriated to the Secretary for the pur-*
22 *poses of carrying out this section—*

23 *(1) \$15,000,000 for fiscal year 2008;*

24 *(2) \$30,000,000 for fiscal year 2009;*

25 *(3) \$45,000,000 for fiscal year 2010;*

- 1 (4) \$60,000,000 for fiscal year 2011; and
- 2 (5) \$70,000,000 for fiscal year 2012.

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