

Calendar No. 351111TH CONGRESS
2^D SESSION**S. 1397****[Report No. 111-168]**

To authorize the Administrator of the Environmental Protection Agency to award grants for electronic device recycling research, development, and demonstration projects, and for other purposes.

IN THE SENATE OF THE UNITED STATES

JULY 6, 2009

Ms. KLOBUCHAR (for herself, Mrs. GILLIBRAND, Ms. COLLINS, Mr. DURBIN, Ms. LANDRIEU, Mr. MERKLEY, and Mrs. FEINSTEIN) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

APRIL 19, 2010

Reported by Mr. REID (for Mrs. BOXER), with an amendment
[Strike out all after the enacting clause and insert the part printed in *italic*]

A BILL

To authorize the Administrator of the Environmental Protection Agency to award grants for electronic device recycling research, development, and demonstration projects, 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,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Electronic Device Re-
3 cycling Research and Development Act”.

4 **SEC. 2. FINDINGS.**

5 Congress finds the following:

6 (1) The volume of electronic devices in the
7 United States is substantial and will continue to
8 grow. The Environmental Protection Agency esti-
9 mates that over 2 billion computers, televisions,
10 wireless devices, printers, gaming systems, and other
11 devices have been sold since 1980, generating 2 mil-
12 lion tons of unwanted electronic devices in 2005
13 alone.

14 (2) Electronic devices can be recycled or refur-
15 bished to recover and conserve valuable materials,
16 such as gold, copper, and platinum. However, ac-
17 cording to the Environmental Protection Agency,
18 only 15 to 20 percent of electronic devices discarded
19 from households reach recyclers.

20 (3) The electronic device recycling industry in
21 the United States is growing; however, challenges re-
22 main for the recycling of electronic devices by house-
23 holds and other small generators. Collection of such
24 electronic devices is expensive, and separation and
25 proper recycling of some of the materials recovered,
26 like lead from cathode-ray tube televisions, is costly.

1 (4) The export of unwanted electronic devices
2 to developing countries also presents a serious chal-
3 lenge. The crude methods of many of the recycling
4 operations in these countries can expose workers to
5 harmful chemicals, jeopardizing their health and pol-
6 luting the environment.

7 (5) Some of the challenges to increasing the
8 recyclability of electronic devices can be addressed
9 by improving the logistics and technology of the col-
10 lection and recycling process, designing electronic
11 devices to avoid the use of hazardous materials and
12 to be more easily recycled, and encouraging the use
13 of recycled materials in more applications.

14 (6) The public currently does not take full ad-
15 vantage of existing electronic device recycling oppor-
16 tunities. Studying factors that influence behavior
17 and educating consumers about responsible elec-
18 tronic device recycling could help communities and
19 private industry develop recycling programs that
20 draw more participation.

21 (7) The development of tools and technologies
22 to increase the lifespan of electronic devices and to
23 promote their safe reuse would decrease the impact
24 of the production of electronic devices on the envi-

1 ronment and likely increase the recyclability of such
2 devices.

3 (8) ~~Accurately~~ assessing the environmental im-
4 pacts of the production of electronic devices and the
5 recycling of such devices is a complex task. Data,
6 tools, and methods to better quantify these impacts
7 would help policymakers and others determine the
8 best end-of-life management options for electronic
9 devices.

10 **SEC. 3. ELECTRONIC DEVICE ENGINEERING RESEARCH,**
11 **DEVELOPMENT, AND DEMONSTRATION**
12 **PROJECTS.**

13 (a) ~~IN GENERAL.~~—The Administrator shall award
14 multiyear grants to consortia to conduct research to create
15 innovative and practical approaches to manage the envi-
16 ronmental impacts of electronic devices and, through the
17 conduct of this research, to contribute to the professional
18 development of scientists, engineers, and technicians in
19 the fields of electronic device manufacturing, design, re-
20 furbishing, and recycling. The grants awarded under this
21 section shall support research to—

22 (1) increase the efficiency of and improve elec-
23 tronic device collection and recycling;

24 (2) expand the uses and applications for mate-
25 rials recovered from electronic devices;

1 (3) develop and demonstrate environmentally
2 friendly alternatives to the use of hazardous and po-
3 tentially hazardous materials in electronic devices
4 and the production of such devices;

5 (4) develop methods to identify, separate, and
6 remove hazardous and potentially hazardous mate-
7 rials from electronic devices and to reuse, recycle, or
8 dispose of such materials in a safe manner;

9 (5) reconsider product design and assembly to
10 facilitate and improve refurbishment, reuse, and re-
11 cycling of electronic devices, including an emphasis
12 on design for recycling;

13 (6) conduct lifecycle analyses of electronic de-
14 vices, including developing tools and methods to as-
15 sess the environmental impacts of the production,
16 use, and end-of-life management of electronic devices
17 and electronic device components;

18 (7) develop product design, tools, and tech-
19 niques to extend the lifecycle of electronic devices,
20 including methods to promote their upgrade and
21 safe reuse; and

22 (8) identify the social, behavioral, and economic
23 barriers to recycling and reuse for electronic devices
24 and develop strategies to increase awareness, con-

1 consumer acceptance, and the practice of responsible re-
2 cycling and reuse for such devices.

3 (b) MERIT REVIEW; COMPETITION.—Grants shall be
4 awarded under this section on a merit-reviewed, competi-
5 tive basis.

6 (c) APPLICATIONS.—A consortium shall submit an
7 application for a grant under this section to the Adminis-
8 trator at such time, in such manner, and containing such
9 information and assurances as the Administrator may re-
10 quire. The application shall include a description of—

11 (1) the research project that will be undertaken
12 by the consortium and the contributions of each of
13 the participating entities, including the for-profit en-
14 tity;

15 (2) the applicability of the project to reduce im-
16 pediments to electronic device recycling in the elec-
17 tronic device design, manufacturing, refurbishing, or
18 recycling industries;

19 (3) the potential for and feasibility of incor-
20 porating the research results into industry practice;
21 and

22 (4) how the project will promote collaboration
23 among scientists and engineers from different dis-
24 ciplines, such as electrical engineering, materials
25 science, and social science.

1 (d) ~~DISSEMINATION OF RESEARCH RESULTS.—~~Re-
2 search results shall be made publicly available through—

3 (1) ~~development of best practices or training~~
4 ~~materials for use in the electronic device manufac-~~
5 ~~turing, design, refurbishing, or recycling industries;~~

6 (2) ~~dissemination at conferences affiliated with~~
7 ~~such industries;~~

8 (3) ~~publication on the Environmental Protection~~
9 ~~Agency's Web site;~~

10 (4) ~~demonstration projects; or~~

11 (5) ~~educational materials for the public pro-~~
12 ~~duced in conjunction with State governments, local~~
13 ~~governments, or nonprofit organizations on problems~~
14 ~~and solutions related to electronic device recycling~~
15 ~~and reuse.~~

16 (e) ~~FUNDING CONTRIBUTION FROM FOR-PROFIT~~
17 ~~MEMBER OF CONSORTIUM.—~~The for-profit entity partici-
18 ~~pating in the consortium shall contribute at least 10 per-~~
19 ~~cent of the total research project cost, either directly or~~
20 ~~with in-kind contributions.~~

21 (f) ~~PROTECTION OF PROPRIETARY INFORMATION.—~~

22 The Administrator—

23 (1) shall not disclose any proprietary informa-
24 tion or trade secrets provided by any person or enti-
25 ty pursuant to this section;

1 (2) shall ensure that, as a condition of receipt
2 of a grant under this section, each member of the
3 consortium has in place proper protections to main-
4 tain proprietary information or trade secrets contrib-
5 uted by other members of the consortium; and

6 (3) if any member of the consortium breaches
7 the conditions under paragraph (2) or discloses pro-
8 prietary information or trade secrets, may require
9 the return of any funds received under this section
10 by such member.

11 (g) BIENNIAL REPORT.—Within 2 years after the
12 date of enactment of this Act, and every 2 years there-
13 after, the Administrator shall transmit a report to Con-
14 gress that provides—

15 (1) a list of the grants awarded under this sec-
16 tion;

17 (2) the entities participating in each consortium
18 receiving a grant;

19 (3) a description of the research projects ear-
20 ried out in whole or in part with funds made avail-
21 able under such a grant;

22 (4) the results of such research projects; and

23 (5) a description of the rate and success of the
24 adoption or integration of such research results into

1 the manufacturing processes, management practices,
2 and products of the electronics industry.

3 (h) ~~AUTHORIZATION OF APPROPRIATIONS.~~—There
4 are authorized to be appropriated to the Administrator to
5 carry out this section:

6 (1) \$18,000,000 for fiscal year 2010.

7 (2) \$20,000,000 for fiscal year 2011.

8 (3) \$22,000,000 for fiscal year 2012.

9 **SEC. 4. NATIONAL ACADEMY OF SCIENCES REPORT ON**
10 **ELECTRONIC DEVICE RECYCLING.**

11 (a) ~~IN GENERAL.~~—In order to better recognize gaps
12 and opportunities in the research and training programs
13 established in this Act, the Administrator shall enter into
14 an arrangement with the National Academy of Sciences
15 for a report, to be transmitted to Congress not later than
16 1 year after the date of enactment of this Act, on—

17 (1) opportunities for and barriers to—

18 (A) increasing the recyclability of elec-
19 tronic devices, specifically addressing—

20 (i) recycling or safe disposal of elec-
21 tronic devices and low value materials re-
22 covered from such devices;

23 (ii) designing electronic devices to fa-
24 cilitate reuse and recycling; and

1 (iii) the reuse of electronic devices;

2 and

3 ~~(B)~~ making electronic devices safer and
4 more environmentally friendly, specifically ad-
5 dressing reducing the use of hazardous mate-
6 rials and potentially hazardous materials in
7 electronic devices;

8 ~~(2)~~ the environmental and human health risks
9 posed by the storage, transport, recycling, and dis-
10 posal of unwanted electronic devices;

11 ~~(3)~~ the current status of research and training
12 programs to promote the environmental design of
13 electronic devices to increase the recyclability of such
14 devices; and

15 ~~(4)~~ any regulatory or statutory barriers that
16 may prevent the adoption or implementation of best
17 management practices or technological innovations
18 that may arise from the research and training pro-
19 grams established in this Act.

20 (b) ~~RECOMMENDATIONS.~~—The report under sub-
21 section (a) shall identify gaps in the current research and
22 training programs in addressing the opportunities, bar-
23 riers, and risks relating to electronic device recycling, and
24 the report shall recommend areas where additional re-
25 search and development resources are needed to reduce

1 the impact of unwanted electronic devices on the environ-
2 ment.

3 **SEC. 5. ENGINEERING CURRICULUM DEVELOPMENT**
4 **GRANTS.**

5 (a) GRANT PROGRAM.—The Administrator, in con-
6 sultation with the Director of the National Science Foun-
7 dation, shall award grants to institutions of higher edu-
8 cation to develop curricula that incorporates the principles
9 of environmental design into the development of electronic
10 devices—

11 (1) for the training of electrical, mechanical, in-
12 dustrial, manufacturing, materials, and software en-
13 gineers and other students at the undergraduate and
14 graduate level; and

15 (2) to support the continuing education of pro-
16 fessionals in the electronic device manufacturing, de-
17 sign, refurbishing, or recycling industries.

18 (b) ELIGIBLE ENTITIES.—The term “institution of
19 higher education”, as such term is used with respect to
20 eligibility to receive a grant under subsection (a)(2), in-
21 cludes any institution of higher education under section
22 101(b) of the Higher Education Act of 1965 (20 U.S.C.
23 1001(b)).

24 (c) OUTREACH TO MINORITY SERVING INSTITU-
25 TIONS.—The Administrator shall conduct outreach to mi-

1 nority serving institutions for the purposes of providing
2 information on the grants available under this section and
3 how to apply for such grants.

4 (d) MERIT REVIEW; COMPETITION.—Grants shall be
5 awarded under this section on a merit-reviewed, competi-
6 tive basis.

7 (e) USE OF FUNDS.—Grants awarded under this sec-
8 tion shall be used for activities that enhance the ability
9 of an institution of higher education to broaden the under-
10 graduate and graduate-level engineering curriculum or
11 professional continuing education curriculum to include
12 environmental engineering design principles and consider-
13 ation of product lifecycles related to electronic devices and
14 increasing the recyclability of such devices. Activities may
15 include—

16 (1) developing and revising curriculum to in-
17 clude multidisciplinary elements;

18 (2) creating research and internship opportuni-
19 ties for students through partnerships with industry,
20 nonprofit organizations, or government agencies;

21 (3) creating and establishing certificate pro-
22 grams; and

23 (4) developing curricula for short courses and
24 continuing education for professionals in the envi-

1 ronmental design of electronic devices to increase the
2 recyclability of such devices.

3 (f) APPLICATION.—An institution of higher education
4 seeking a grant under this section shall submit an applica-
5 tion to the Administrator at such time, in such manner,
6 and with such information and assurances as the Adminis-
7 trator may require.

8 (g) AUTHORIZATION OF APPROPRIATIONS.—There
9 are authorized to be appropriated to the Administrator to
10 carry out this section:

11 (1) \$5,000,000 for fiscal year 2010.

12 (2) \$5,150,000 for fiscal year 2011.

13 (3) \$5,304,000 for fiscal year 2012.

14 **SEC. 6. ENVIRONMENTALLY FRIENDLY ALTERNATIVE MA-**
15 **TERIALS PHYSICAL PROPERTY DATABASE.**

16 (a) IN GENERAL.—The Director shall establish an
17 initiative to develop a comprehensive physical property
18 database for environmentally friendly alternative materials
19 for use in electronic devices.

20 (b) PRIORITIES.—The Director, working with the
21 electronic device design, manufacturing, or recycling in-
22 dustries, shall develop a strategic plan to establish prior-
23 ities and the physical property characterization require-
24 ments for the database described in subsection (a).

1 ~~(c) AUTHORIZATION OF APPROPRIATIONS.—~~There
 2 are authorized to be appropriated to the Administrator to
 3 carry out this section:

4 ~~(1) \$3,000,000 for fiscal year 2010.~~

5 ~~(2) \$3,000,000 for fiscal year 2011.~~

6 ~~(3) \$3,000,000 for fiscal year 2012.~~

7 **SEC. 7. DEFINITIONS.**

8 For the purposes of this Act:

9 ~~(1) ADMINISTRATOR.—~~The term “Adminis-
 10 trator” means the Administrator of the Environ-
 11 mental Protection Agency.

12 ~~(2) CONSORTIUM.—~~The term “consortium”
 13 means a grant applicant or recipient under section
 14 ~~3(a)~~ that includes—

15 ~~(A)~~ at least one institution of higher edu-
 16 cation, nonprofit research institution, or govern-
 17 ment laboratory; and

18 ~~(B)~~ at least one for-profit entity, including
 19 a manufacturer, designer, refurbisher, or recy-
 20 cler of electronic devices or the components of
 21 such devices.

22 ~~(3) DIRECTOR.—~~The term “Director” means
 23 the Director of the National Institute of Standards
 24 and Technology.

1 (4) **ELECTRONIC DEVICE.**—The term “elec-
 2 tronic device” may include computers, computer
 3 monitors, televisions, laptops, printers, wireless de-
 4 vices, copiers, fax machines, stereos, video gaming
 5 systems, and the components of such devices.

6 (5) **INSTITUTION OF HIGHER EDUCATION.**—The
 7 term “institution of higher education” has the
 8 meaning given such term in section 101(a) of the
 9 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

10 (6) **MINORITY SERVING INSTITUTION.**—The
 11 term “minority serving institution” means an insti-
 12 tution that is an eligible institution under section
 13 371(a) of the Higher Education Act of 1965 (20
 14 U.S.C. 1067q(a)).

15 **SECTION 1. SHORT TITLE.**

16 *This Act may be cited as the “Electronic Device Recy-
 17 cling Research and Development Act”.*

18 **SEC. 2. FINDINGS.**

19 *Congress finds that—*

20 (1) *the volume of electronic devices in the United
 21 States is substantial and will continue to increase;*

22 (2) *the Environmental Protection Agency esti-
 23 mates that more than 2,000,000,000 computers, tele-
 24 visions, wireless devices, printers, gaming systems,
 25 and other devices have been sold since 1980, gener-*

1 *ating 2,000,000 tons of unwanted electronic devices in*
2 *2005 alone;*

3 *(3) electronic devices can be recycled or refur-*
4 *bished to recover and conserve valuable materials,*
5 *such as gold, copper, and platinum, but, according to*
6 *the Environmental Protection Agency, only 15 to 20*
7 *percent of electronic devices discarded from households*
8 *reach recyclers;*

9 *(4) the electronic device recycling industry in the*
10 *United States is growing, but challenges remain for*
11 *the recycling of electronic devices by households and*
12 *other small generators;*

13 *(5) collection of those electronic devices is expen-*
14 *sive, and separation and proper recycling of some of*
15 *the materials recovered, such as lead from cathode-ray*
16 *tube televisions, is costly;*

17 *(6) the export of unwanted electronic devices to*
18 *developing countries also presents a serious challenge;*

19 *(7) the crude methods of many of the recycling*
20 *operations in those countries can expose workers to*
21 *harmful chemicals, jeopardizing the health of the*
22 *workers and polluting the environment;*

23 *(8) some of the challenges to increasing the*
24 *recyclability of electronic devices can be addressed*
25 *by—*

1 (A) *improving the logistics and technology*
2 *of the collection and recycling process;*

3 (B) *designing electronic devices to avoid the*
4 *use of hazardous materials and to be more easily*
5 *recycled; and*

6 (C) *encouraging the use of recycled mate-*
7 *rials in more applications;*

8 (9) *the public currently does not take full advan-*
9 *tage of existing electronic device recycling opportuni-*
10 *ties;*

11 (10) *studying factors that influence behavior and*
12 *educating consumers about responsible electronic de-*
13 *vice recycling could help communities and private in-*
14 *dustry develop recycling programs that draw more*
15 *participation;*

16 (11) *the development of tools and technologies to*
17 *increase the lifespan of electronic devices and to pro-*
18 *mote the safe reuse of those devices would decrease the*
19 *impact of the production of electronic devices on the*
20 *environment and likely increase the recyclability of*
21 *those devices;*

22 (12) *accurately assessing the environmental im-*
23 *pacts of the production of electronic devices and the*
24 *recycling of those devices is a complex task; and*

1 (13) data, tools, and methods to better quantify
2 those impacts would help policymakers and others de-
3 termine the best end-of-life management options for
4 electronic devices.

5 **SEC. 3. DEFINITIONS.**

6 *In this Act:*

7 (1) *ACADEMY.*—The term “Academy” means the
8 National Academy of Sciences.

9 (2) *ADMINISTRATOR.*—The term “Adminis-
10 trator” means the Administrator of the Environ-
11 mental Protection Agency.

12 (3) *CONSORTIUM.*—The term “consortium”
13 means a grant applicant or recipient under section
14 4(a) that includes—

15 (A) at least 1 institution of higher edu-
16 cation, nonprofit research institution, or govern-
17 ment laboratory; and

18 (B) at least 1 for-profit entity, including a
19 manufacturer, designer, refurbisher, or recycler
20 of electronic devices or the components of those
21 devices.

22 (4) *DIRECTOR.*—The term “Director” means the
23 Director of the National Institute of Standards and
24 Technology.

1 (5) *ELECTRONIC DEVICE*.—The term “*electronic*
 2 *device*” includes computers, computer monitors, tele-
 3 *visions, laptops, printers, wireless devices, copiers, fax*
 4 *machines, stereos, video gaming systems, and the com-*
 5 *ponents of those devices.*

6 (6) *INSTITUTION OF HIGHER EDUCATION*.—The
 7 term “*institution of higher education*”—

8 (A) has the meaning given the term in sec-
 9 *tion 101(a) of the Higher Education Act of 1965*
 10 *(20 U.S.C. 1001(a)); and*

11 (B) for the purpose of section 7(a)(2), in-
 12 *cludes any institution of higher education under*
 13 *section 101(b) of that Act (20 U.S.C. 1001(b)).*

14 (7) *MINORITY SERVING INSTITUTION*.—The term
 15 “*minority serving institution*” means an institution
 16 *that is an eligible institution under section 371(a) of*
 17 *the Higher Education Act of 1965 (20 U.S.C.*
 18 *1067q(a)).*

19 **SEC. 4. ELECTRONIC DEVICE ENGINEERING RESEARCH, DE-**
 20 **VELOPMENT, AND DEMONSTRATION**
 21 **PROJECTS GRANT PROGRAM.**

22 (a) *GRANT PROGRAM*.—

23 (1) *IN GENERAL*.—The Administrator shall pro-
 24 *vide multiyear grants to consortia—*

1 (A) to conduct research to create innovative
2 and practical approaches to manage the environ-
3 mental impacts of electronic devices; and

4 (B) through the conduct of that research, to
5 contribute to the professional development of sci-
6 entists, engineers, and technicians in the fields of
7 electronic device manufacturing, design, refurb-
8 ishing, and recycling.

9 (2) *TYPES OF RESEARCH.*—The grants provided
10 under this section shall support research—

11 (A) to provide data and information on—

12 (i) effects, human exposures, environ-
13 mental releases, and recycling and disposal
14 processes; and

15 (ii) changes to manufacturing and
16 other processes, such as refurbishing and re-
17 cycling, to reduce—

18 (I) adverse human health and en-
19 vironmental impacts; and

20 (II) the volume of unwanted elec-
21 tronic devices;

22 (B) to increase the efficiency of and im-
23 prove electronic device collection and recycling;

24 (C) to expand the uses and applications for
25 materials recovered from electronic devices;

1 (D) to develop and demonstrate environ-
2 mentally preferable alternatives to the use of
3 toxic, hazardous, potentially hazardous, or scarce
4 materials in electronic devices and the produc-
5 tion of those devices;

6 (E) to develop methods to identify, separate,
7 and remove hazardous and potentially hazardous
8 materials from electronic devices and to reuse,
9 recycle, or dispose of those materials in a safe
10 manner;

11 (F) to modify product design and assembly
12 to facilitate and improve refurbishment, reuse,
13 and recycling of electronic devices, including an
14 emphasis on design for recycling;

15 (G) to conduct lifecycle analyses of elec-
16 tronic devices, including developing tools and
17 methods to assess the environmental impacts of
18 the production, use, and end-of-life management
19 of electronic devices and electronic device compo-
20 nents;

21 (H) to develop product design, tools, and
22 techniques to extend the lifecycle of electronic de-
23 vices, including methods to promote the upgrade
24 and safe reuse of those devices;

1 (I) to identify the social, behavioral, and
2 economic barriers to recycling and reuse for elec-
3 tronic devices and develop strategies to increase
4 awareness, consumer acceptance, and the prac-
5 tice of responsible recycling and reuse for those
6 devices;

7 (J) to characterize environmental releases
8 from electronic device recycling processes, includ-
9 ing—

10 (i) evaluating dermal or inhalation ex-
11 posure to dusts or fumes from shredding,
12 disassembly, or thermal processes; and

13 (ii) investigating appropriate control
14 or mitigation processes;

15 (K) to assess exposure risks, and develop
16 control and strategies to mitigate contaminant
17 releases, from disposal of electronic devices and
18 recycling residuals, such as landfill leachate,
19 smelter emissions, and smelter residues that pose
20 human health and environmental risks;

21 (L) to evaluate alternative materials and
22 management processes that would reduce toxics
23 use, extend product life, and enhance recycling of
24 electronic devices over disposal;

1 (M) to quantify the environmental benefits
2 of making the purchase, use, and end-of-life
3 management of electronic devices more environ-
4 mentally preferable, including improved designs
5 to enhance the reuse and recyclability of new
6 electronic devices through research on materials
7 and life cycle impacts;

8 (N) to characterize the flow of unwanted
9 electronic devices in global commerce, including
10 identifying—

11 (i) specific hazardous materials and
12 the products that contain the materials; and

13 (ii) the ultimate destinations of those
14 materials through reuse, disposal, or incor-
15 poration in new products;

16 (O) to develop methods to discourage exports
17 to countries with unsafe recycling practices of re-
18 cyclable materials from electronic devices that
19 could be processed into usable commodities in the
20 United States or in North America, including
21 identifying—

22 (i) what kind of additional, specialized
23 capacity is needed;

24 (ii) existing barriers to the develop-
25 ment of that capacity; and

1 (iii) options for overcoming those bar-
2 riers;

3 (P) to assess—

4 (i) current recovery rates for precious
5 and critical metals in various processing re-
6 gimes, such as manual disassembly, shred-
7 ding of whole or partially dismantled elec-
8 tronic devices, and smelting; and

9 (ii) how to optimize the recovery of
10 precious metals and critical metals in the
11 recycling of discarded electronic devices;

12 (Q) to track quantities of specific elements
13 and substances used in electronic devices over
14 time; and

15 (R) to determine current and predicted
16 quantities and types of electronic devices used,
17 stored, generated, collected for recycling, ex-
18 ported, and disposed to quantify and analyze the
19 flow of electronic devices from the point of sale
20 to the end of life of the devices.

21 (b) *MERIT REVIEW; COMPETITION.*—Grants shall be
22 provided under this section on a merit-reviewed, competi-
23 tive basis.

24 (c) *APPLICATIONS.*—

1 (1) *IN GENERAL.*—*To be eligible to receive a*
2 *grant under this section, a consortium shall submit*
3 *an application for the grant to the Administrator at*
4 *such time, in such manner, and containing such in-*
5 *formation and assurances as the Administrator may*
6 *require.*

7 (2) *REQUIREMENTS.*—*The application shall in-*
8 *clude a description of—*

9 (A) *the research project that will be under-*
10 *taken by the consortium and the contributions of*
11 *each of the participating entities, including the*
12 *for-profit entity;*

13 (B) *the applicability of the project to reduce*
14 *impediments to electronic device recycling in the*
15 *electronic device design, manufacturing, refur-*
16 *bishing, or recycling industries;*

17 (C) *the potential for and feasibility of in-*
18 *corporating the research results into industry*
19 *practice; and*

20 (D) *how the project will promote collabora-*
21 *tion among scientists and engineers from dif-*
22 *ferent disciplines, such as electrical engineering,*
23 *materials science, and social science.*

24 (d) *DISSEMINATION OF RESEARCH RESULTS.*—*Re-*
25 *search results shall be made publicly available through—*

1 (1) *publication on the website of the Environ-*
2 *mental Protection Agency;*

3 (2) *the development of best practices or training*
4 *materials for use in the electronic device manufac-*
5 *turing, design, refurbishing, or recycling industries;*

6 (3) *the dissemination at conferences affiliated*
7 *with those industries;*

8 (4) *demonstration projects; or*

9 (5) *educational materials for the public produced*
10 *in conjunction with State governments, local govern-*
11 *ments, or nonprofit organizations on problems and*
12 *solutions relating to electronic device recycling and*
13 *reuse.*

14 (e) *FUNDING CONTRIBUTION FROM FOR-PROFIT MEM-*
15 *BER OF CONSORTIUM.—To be eligible for a grant under this*
16 *section, the for-profit entity participating in the consortium*
17 *shall contribute at least 10 percent of the total research*
18 *project cost, either directly or through the provision of in-*
19 *kind contributions.*

20 (f) *PROTECTION OF PROPRIETARY INFORMATION.—*
21 *The Administrator—*

22 (1) *shall not disclose any proprietary informa-*
23 *tion or trade secrets provided by any person or entity*
24 *pursuant to this section;*

1 (2) shall ensure that, as a condition of receipt of
2 a grant under this section, each member of the consor-
3 tium has in place proper protections to maintain
4 proprietary information or trade secrets contributed
5 by other members of the consortium; and

6 (3) if any member of the consortium breaches the
7 conditions under paragraph (2) or discloses propri-
8 etary information or trade secrets, may require the
9 return of any funds received under this section by the
10 member.

11 (g) *BIENNIAL REPORT.*—Not later than 2 years after
12 the date of enactment of this Act and every 2 years there-
13 after until Congress does not provide funds to carry out
14 this Act, the Administrator shall submit to Congress a re-
15 port that provides—

16 (1) a list of the grants provided under this sec-
17 tion;

18 (2) a list of the entities participating in each
19 consortium receiving a grant;

20 (3) a description of the research projects carried
21 out in whole or in part with funds made available
22 under such a grant;

23 (4) the results of those research projects; and

24 (5) a description of the rate and success of the
25 adoption or integration of such research results into

1 *the manufacturing processes, management practices,*
 2 *and products of the electronics industry.*

3 *(h) AUTHORIZATION OF APPROPRIATIONS.—There are*
 4 *authorized to be appropriated to the Administrator to carry*
 5 *out this section—*

6 *(1) \$18,000,000 for fiscal year 2011;*

7 *(2) \$20,000,000 for fiscal year 2012; and*

8 *(3) \$22,000,000 for fiscal year 2013.*

9 **SEC. 5. ELECTRONIC DEVICE ENGINEERING RESEARCH, DE-**
 10 **VELOPMENT, AND DEMONSTRATION**
 11 **PROJECTS OF ENVIRONMENTAL PROTECTION**
 12 **AGENCY.**

13 *(a) IN GENERAL.—The Administrator, through an ap-*
 14 *plied research program of the Office of Research and Devel-*
 15 *opment of the Environmental Protection Agency, shall con-*
 16 *duct research for the purposes described in and on the topics*
 17 *listed in section 4(a).*

18 *(b) AUTHORIZATION OF APPROPRIATIONS.—There are*
 19 *authorized to be appropriated to the Administrator to carry*
 20 *out this section \$10,000,000 for each of fiscal years 2011*
 21 *through 2013.*

22 **SEC. 6. NATIONAL ACADEMY OF SCIENCES REPORT ON**
 23 **ELECTRONIC DEVICE RECYCLING.**

24 *(a) IN GENERAL.—In order to better identify gaps and*
 25 *opportunities in the research and training programs estab-*

1 *lished under this Act, the Administrator shall enter into*
2 *an arrangement with the Academy under which the Acad-*
3 *emy shall, not later than 1 year after the date of enactment*
4 *of this Act, complete and submit to Congress a report on—*

5 *(1) opportunities for and barriers to—*

6 *(A) increasing the recyclability of electronic*
7 *devices, specifically addressing—*

8 *(i) recycling or safe disposal of elec-*
9 *tronic devices and low-value materials re-*
10 *covered from those devices;*

11 *(ii) designing electronic devices to fa-*
12 *cilitate reuse and recycling; and*

13 *(iii) the reuse of electronic devices; and*

14 *(B) making electronic devices safer and*
15 *more environmentally preferable, specifically ad-*
16 *dresssing reducing the use of hazardous materials*
17 *and potentially hazardous materials in electronic*
18 *devices;*

19 *(2) the environmental and human health risks*
20 *posed by the storage, transport, recycling, and dis-*
21 *posal of unwanted electronic devices;*

22 *(3) the current status of research and training*
23 *programs to promote the environmental design of elec-*
24 *tronic devices to increase the recyclability of those de-*
25 *vices;*

1 (4) *any regulatory or statutory barriers that*
 2 *may prevent the adoption or implementation of best*
 3 *management practices or technological innovations*
 4 *that may arise from the research and training pro-*
 5 *grams established under this Act; and*

6 (5) *the direct and indirect economic and domes-*
 7 *tic employment impacts associated with recycling and*
 8 *harvesting materials from unwanted electronic devices*
 9 *in lieu of the disposal of those devices directly in*
 10 *landfills.*

11 (b) *RECOMMENDATIONS.*—*The report under subsection*

12 (a) *shall—*

13 (1) *identify gaps in the research and training*
 14 *programs in addressing the opportunities, barriers,*
 15 *and risks relating to electronic device recycling; and*

16 (2) *recommend areas in which additional re-*
 17 *search and development resources are needed to reduce*
 18 *the impact of unwanted electronic devices on the envi-*
 19 *ronment.*

20 **SEC. 7. ENGINEERING CURRICULUM DEVELOPMENT**
 21 **GRANTS.**

22 (a) *GRANT PROGRAM.*—*The Administrator, in con-*
 23 *sultation with the Director of the National Science Founda-*
 24 *tion, shall provide grants to institutions of higher education*
 25 *to develop curricula that incorporates the principles of envi-*

1 *ronmental design into the development of electronic de-*
 2 *vices—*

3 (1) *for the training of electrical, mechanical, in-*
 4 *dustrial, manufacturing, materials, and software en-*
 5 *gineers and other students at the undergraduate and*
 6 *graduate levels; and*

7 (2) *to support the continuing education of pro-*
 8 *fessionals in the electronic device manufacturing, de-*
 9 *sign, refurbishing, or recycling industries.*

10 (b) *OUTREACH TO MINORITY SERVING INSTITU-*
 11 *TIONS.—The Administrator shall conduct outreach to mi-*
 12 *nority serving institutions for the purposes of providing in-*
 13 *formation on—*

14 (1) *the grants available under this section; and*

15 (2) *the application process for those grants.*

16 (c) *MERIT REVIEW; COMPETITION.—Grants shall be*
 17 *provided under this section on a merit-reviewed, competi-*
 18 *tive basis.*

19 (d) *USE OF FUNDS.—*

20 (1) *IN GENERAL.—Grants provided under this*
 21 *section shall be used for activities that enhance the*
 22 *ability of an institution of higher education to broad-*
 23 *en the undergraduate and graduate-level engineering*
 24 *curriculum or professional continuing education cur-*
 25 *riculum—*

1 (A) to include environmental engineering
2 design principles and consideration of product
3 lifecycles relating to electronic devices; and

4 (B) to increase the recyclability of those de-
5 vices.

6 (2) *INCLUDED ACTIVITIES.*—Activities carried
7 out using funds from a grant may include—

8 (A) developing and revising curriculum to
9 include multidisciplinary elements;

10 (B) creating research and internship oppor-
11 tunities for students through partnerships with
12 industry, nonprofit organizations, or government
13 agencies;

14 (C) creating and establishing certificate
15 programs; and

16 (D) developing curricula for short courses
17 and continuing education for professionals in the
18 environmental design of electronic devices to in-
19 crease the recyclability of those devices.

20 (e) *APPLICATION.*—An institution of higher education
21 seeking a grant under this section shall submit an applica-
22 tion to the Administrator at such time, in such manner,
23 and with such information and assurances as the Adminis-
24 trator may require.

1 (f) *AUTHORIZATION OF APPROPRIATIONS.*—*There are*
 2 *authorized to be appropriated to the Administrator to carry*
 3 *out this section—*

4 (1) *\$5,000,000 for fiscal year 2011;*

5 (2) *\$5,150,000 for fiscal year 2012; and*

6 (3) *\$5,304,000 for fiscal year 2013.*

7 **SEC. 8. ENVIRONMENTALLY PREFERABLE ALTERNATIVE**
 8 **MATERIALS PHYSICAL PROPERTY DATABASE.**

9 (a) *ESTABLISHMENT.*—

10 (1) *IN GENERAL.*—*The Director shall develop a*
 11 *comprehensive physical property database for envi-*
 12 *ronmentally preferable alternative materials, design*
 13 *features, and manufacturing practices for use in elec-*
 14 *tronic devices.*

15 (2) *CONSULTATION.*—*In developing the database*
 16 *under this section, the Director shall consult with the*
 17 *Administrator regarding the environmental prefer-*
 18 *ability of the materials, design features, and manu-*
 19 *facturing processes to be contained in the database.*

20 (b) *PRIORITIES.*—*The Director, working with the elec-*
 21 *tronic device design, manufacturing, or recycling indus-*
 22 *tries, shall develop a strategic plan to establish priorities*
 23 *and the physical property characterization requirements for*
 24 *the database described in subsection (a).*

1 (c) *OTHER MATTERS.*—*The Director may expand the*
2 *database to include information on the environmental im-*
3 *pacts of various materials, design features, and manufac-*
4 *turing practices used in electronic devices from a lifecycle*
5 *standpoint.*

6 (d) *ANNUAL UPDATES.*—*The Director shall update the*
7 *database not less than annually.*

8 (e) *AUTHORIZATION OF APPROPRIATIONS.*—*There are*
9 *authorized to be appropriated to the Director to carry out*
10 *this section—*

11 (1) *\$3,000,000 for fiscal year 2011;*

12 (2) *\$3,000,000 for fiscal year 2012; and*

13 (3) *\$3,000,000 for fiscal year 2013.*

Calendar No. 351

111TH CONGRESS
2^D SESSION

S. 1397

[Report No. 111-168]

A BILL

To authorize the Administrator of the Environmental Protection Agency to award grants for electronic device recycling research, development, and demonstration projects, and for other purposes.

APRIL 19, 2010

Reported with an amendment