

## Calendar No. 351

111TH CONGRESS }  
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SENATE

{ REPORT  
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### ELECTRONIC DEVICE RECYCLING RESEARCH AND DEVELOPMENT ACT

APRIL 19, 2010.—Ordered to be printed

Mr. REID (for Mrs. BOXER), from the Committee on Environment  
and Public Works, submitted the following

### R E P O R T

[To accompany S. 1397]

[Including cost estimate of the Congressional Budget Office]

The Committee on Environment and Public Works, to which was referred a bill (S. 1397) to authorize the Administrator of the Environmental Protection Agency to provide grants for electronic device recycling research, development, and demonstration projects, and for other purposes, having considered the same, reports favorably thereon with an amendment and recommends that the bill, as amended, do pass.

#### INTRODUCTION AND PURPOSES

The Electronic Device Recycling Research and Development Act was introduced by Senators Klobuchar and Gillibrand on July 6, 2009, and referred to the Committee on Environment and Public Works. The bill was considered at a markup by the Committee held on December 10, 2009. At the December 10, 2009, markup, Senator Klobuchar offered a substitute amendment which was agreed to by voice vote and the bill was ordered favorably reported, as amended.

The Act's primary purposes are to: authorize EPA to award multi-year grants to consortia to conduct research on innovative and practical approaches to manage the human health and environmental impacts of electronic devices through recycling, reuse, reduction of the use of hazardous materials, and life-cycle extension; authorize EPA to award grants to higher education institutions to develop curricula for environmental design in electronic devices; require a National Academy of Sciences report to Congress

on unwanted electronics issues; and require the National Institute of Standards and Technology to establish a physical property database for environmentally preferable alternative materials, design features, and manufacturing practices for use in electronic devices.

The substitute amendment added an authorization of appropriations for EPA to conduct research, expanded the scope of the research to include human health impacts, and pushed back the date of the grants by one year.

#### BACKGROUND AND NEED FOR LEGISLATION

The rapidly increasing number of unwanted electronic devices, including televisions, computers, cell phones, printers, gaming systems, and other electronic devices, is a growing problem in the United States and throughout the world. Rapid advances in technology have resulted in enormous increases in sales of new electronic devices, but have also resulted in electronic devices becoming obsolete more quickly. According to the Consumer Electronics Association, Americans own approximately 24 electronic devices per household.<sup>1</sup> Many electronic devices are not designed to be easily recycled and often contain toxic or hazardous substances. The U.S. Environmental Protection Agency (EPA) estimates that over 2 billion electronic devices have been sold in the United States since 1980, generating 2 million tons of unwanted electronic devices in 2005 alone.<sup>2</sup> However, according to EPA, only 15 to 20 percent of unwanted electronic devices are recycled, while most end up in municipal solid waste landfills and incinerators.<sup>3</sup> Hazardous substances from electronic devices disposed of in municipal solid waste landfills and electronic devices burned in municipal solid waste incinerators can release toxic substances into the environment.<sup>4</sup>

Unwanted electronic devices can be refurbished and reused or recycled to recover and conserve valuable materials, such as gold, copper, platinum, and rare earth metals.<sup>5</sup> For example, the United States Geological Survey reports that 1 metric ton of computer scrap contains more gold than 17 tons of ore and much lower levels of toxic elements, such as arsenic, mercury, and sulfur.<sup>6</sup>

While the electronic device recycling industry in the United States is growing, many challenges remain for the recycling of electronic devices, particularly by households and other small genera-

<sup>1</sup> Consumer Electronics Association Market Research Report: "Trends in Consumer Electronics Reuse, Recycle and Removal" (April 2008).

<sup>2</sup> "EPA Fact Sheet: Management of Electronic Waste in the United States", EPA530-F-08-014, April 2007 (revised July 2008); online at: <http://www.epa.gov/epawaste/conserve/materials/recycling/docs/fact7-08.pdf>; "EPA 2008 Statistics on the Management of Used and End-Of-Life Electronics," <http://www.epa.gov/epawaste/conserve/materials/recycling/management.htm>; "EPA Municipal Solid Waste in the United States, 2007 Facts and Figures", EPA530-R-08-010, November 2008; online at: <http://www.epa.gov/epawaste/nonhaz/municipal/pubs/msw07-rpt.pdf>.

<sup>3</sup> "EPA Fact Sheet: Management of Electronic Waste in the United States", EPA530-F-08-014, April 2007 (revised July 2008); online at: <http://www.epa.gov/epawaste/conserve/materials/recycling/docs/fact7-08.pdf>.

<sup>4</sup> EPA Proposed Rule, "Hazardous Waste Management System; Modification of the Hazardous Waste Program; Cathode Ray Tubes and Mercury-Containing Equipment", 67 Fed. Reg. 40508, 40522 (June 12, 2002).

<sup>5</sup> Testimony of John B. Stephenson, Director, Natural Resources and Environment, U.S. Government Accountability Office, before Senate Committee on Environment and Public Works, "Electronic Waste," July 26, 2005, S. HRG. 109-988 at 55; U.S. Department of the Interior, U.S. Geological Survey Fact Sheet 087-02, "Rare Earth Elements—Critical Resources for High Technology" (2002); online at: <http://pubs.usgs.gov/fs/2002/fs087-02/fs087-02.pdf>.

<sup>6</sup> U.S. Department of the Interior, U.S. Geological Survey Fact Sheet 060-01, "Obsolete Computers, 'Gold Mine,' or High-Tech Trash? Resource Recovery from Recycling" (July 2001).

tors. Collection of the millions of unwanted electronic devices spread out over urban, suburban, and rural areas presents an expensive and logistical challenge. Also the separation and proper recycling of some of the materials recovered, such as lead from cathode-ray tube (CRT) televisions, is costly.<sup>7</sup>

The export of unwanted electronic devices to countries that lack the infrastructure required to properly recycle unwanted electronic devices also presents a serious challenge. The crude methods of many of the recycling operations in these countries can expose workers to harmful chemicals, jeopardizing their health and polluting the environment.<sup>8</sup>

Some of the challenges to increasing the recyclability of electronic devices can be addressed by improving the logistics and technology of the collection and recycling process, designing electronic devices to avoid the use of hazardous materials and to be more easily recycled, and encouraging the use of recycled materials in more applications.<sup>9</sup> The public currently does not take full advantage of existing electronic device recycling opportunities, with many unwanted electronic devices being stored in people's homes. Studying factors that influence behavior and educating consumers about responsible electronic device recycling could help communities and private industry develop recycling programs that draw more participation.<sup>10</sup>

The development of tools and technologies to increase the lifespan of electronic devices and to promote their safe reuse would decrease the impact of the production of electronic devices on the environment and likely increase the recyclability of such devices.<sup>11</sup>

<sup>7</sup>Testimony of Scott Slesinger, Vice President for Government Affairs, Environmental Technology Council, before Senate Committee on Environment and Public Works, "Electronic Waste," July 26, 2005, S. HRG. 109-988 at 40; Response to Additional Questions by Richard Goss, Director of Environmental Affairs, Electronic Industries Alliance, before Senate Committee on Environment and Public Works, "Electronic Waste," July 26, 2005, S. HRG. 109-988 at 116-117; Statement of Renee St. Denis, Director of America's Product Take-Back and Recycling, Hewlett Packard Company, Before House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110-98 at 27; Statement of Eric Harris, Associate Counsel/Director of Government and International Affairs, Institute of Scrap Recycling Industries, Before House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110-98 at 30.

<sup>8</sup>Statement of Sheila Davis, Executive Director, Silicon Valley Toxics Coalition, before Senate Committee on Environment and Public Works, "Electronic Waste," July 26, 2005, S. HRG. 109-988 at 27-28; U.S. Government Accountability Office Report "Electronic Waste—EPA Needs to Better Control Harmful U.S. Exports Through Stronger Enforcement and More Comprehensive Regulation," GAO-08-1044, August 2008; Statement of Dr. Valerie Thomas, Associate Professor, Georgia Institute of Technology, Before House Committee on Science and Technology, 111th Cong., 1st Sess., Feb. 11, 2009, Serial No. 111-1 at 17; Statement of Dr. Eric D. Williams, Assistant Professor of Civil and Environmental Engineering, Arizona State University, Before House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110-98 at 13-14.

<sup>9</sup>Testimony of Richard Goss, Director of Environmental Affairs, Electronic Industries Alliance, before Senate Committee on Environment and Public Works, "Electronic Waste," July 26, 2005, S. HRG. 109-988 at 39; Statement of Dr. Valerie Thomas, Associate Professor, Georgia Institute of Technology, Before House Committee on Science and Technology, 111th Cong., 1st Sess., Feb. 11, 2009, Serial No. 111-1 at 17; Statement of Dr. Eric D. Williams, Assistant Professor of Civil and Environmental Engineering, Arizona State University, Before House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110-98 at 16; Statement of Eric Harris, Associate Counsel/Director of Government and International Affairs, Institute of Scrap Recycling Industries, Before House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110-98 at 29.

<sup>10</sup>Testimony of Renee St. Denis, Director of America's Product Take-Back and Recycling, Hewlett Packard Company, Before House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110-98 at 55.

<sup>11</sup>Statement of John B. Stephenson, Director, Natural Resources and Environment, U.S. Government Accountability Office, before Senate Committee on Environment and Public Works, "Electronic Waste," July 26, 2005, S. HRG. 109-988 at 62; Statement of Dr. Eric D. Williams,

Accurately assessing the human health and environmental impacts of the production and recycling of electronic devices is a complex task and should be addressed cooperatively by relevant stakeholders, including EPA’s Office of Research and Development, the electronic device manufacturing and recycling industries, public health and environmental groups, and academia. Data, tools, and methods to better quantify these impacts would help policymakers and other stakeholders determine the best end-of-life management options for electronic devices.<sup>12</sup>

This bill will authorize EPA grants and in-house research and development programs to advance our understanding of how to make electronic devices in more environmentally preferable ways and to ensure the responsible recycling of the materials they contain. This research and development program will create tools to expand knowledge in EPA and industry to better protect public health and the environment, enhance competitiveness, and grow business opportunities and jobs in the electronic device manufacturing and recycling industries.

#### SECTION-BY-SECTION ANALYSIS

##### *Section 1. Short title*

###### Summary

This section provides that the Act may be cited as “The Electronic Device Recycling Research and Development Act.”

##### *Section 2. Findings*

###### Summary

This section outlines the scope of the challenges and issues relating to the recycling of electronic devices in the United States and how a research and development program will provide the tools for policymakers and stakeholders to increase the recycling of unwanted electronic devices and to reduce the human health and environmental impacts of the production and recycling of electronic devices.

##### *Section 3. Definitions*

###### Summary

This section defines the following terms:

- (1) The “Academy” is the National Academy of Sciences.
- (2) The “Administrator” is the Administrator of EPA.

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Assistant Professor of Civil and Environmental Engineering, Arizona State University, Before House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110–98 at 15; Statement of Ted Smith, Chair, Electronics TakeBack Coalition, Before House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110–98 at 38; Responses by Dr. Eric D. Williams, Assistant Professor of Civil and Environmental Engineering, Arizona State University, to Questions Submitted by Chairman Bart Gordon, House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110–98 at 63–64.

<sup>12</sup>Statement of Dr. Eric D. Williams, Assistant Professor of Civil and Environmental Engineering, Arizona State University, Before House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110–98 at 13; Statement of Renee St. Denis, Director of America’s Product Take-Back and Recycling, Hewlett Packard Company, Before House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110–98 at 28; Responses by Dr. Eric D. Williams, Assistant Professor of Civil and Environmental Engineering, Arizona State University, to Questions Submitted by Chairman Bart Gordon, House Committee on Science and Technology, 110th Cong., 2nd Sess., April 30, 2008, Serial No. 110–98 at 62.

(3) A “Consortium” is a grant applicant or recipient under Section 4 that includes: (a) at least 1 institution of higher education, nonprofit research institution, or government laboratory; and (b) at least 1 for-profit entity, including a manufacturer, designer, refurbisher, or recycler of electronic devices or components of those devices.

(4) The “Director” is the Director of the National Institute of Standards and Technology.

(5) An “electronic device” includes computers (including laptops and notebooks), computer monitors, televisions, printers, wireless devices (including cell phones, pagers, and personal digital assistants (PDAs)), copiers, fax machines, stereos, video gaming systems, and the components of electronic devices.

(6) An “institution of higher education” has the meaning given the term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)), and for the purpose of section 7(a)(2) of the bill, includes any institution of higher education under section 101(b) of that Act (20 U.S.C. 1001(b)).

(7) A “minority serving institution” is an institution that is eligible under section 371(a) of the Higher Education Act of 1965 (20 U.S.C. 1067q(a)).

*Section 4. Electronic Device Engineering Research, Development, and Demonstration Projects Grant Program*

*Subsection (a)—Grant program*

*Summary*

Subsection (a) directs the Administrator to provide multi-year grants to consortia to conduct research on managing the human health and environmental impacts of electronic devices through recycling, reuse, reduction of the use of hazardous materials, and life-cycle extension, and to contribute to the professional development of scientists, engineers, and technicians in the fields of electronic device manufacturing, design, refurbishing, and recycling.

*Discussion*

The EPA grants program will promote research to increase knowledge of how to make electronic devices in more environmentally preferable ways throughout their life-cycle and to ensure the responsible recycling of the materials they contain. This research and development program will create tools to expand knowledge in EPA and industry to better protect public health and the environment, enhance competitiveness, and grow business opportunities and jobs in the electronic device manufacturing and recycling industries.

The substitute amendment expanded the scope of the types of research that grants will support, including to authorize research on the risks to human health and the environment from the recycling of unwanted electronic devices, as well as the risks to human health and the environment from the disposal of electronic devices and recycling residues, such as leachate from landfills and emissions and combustion residues from municipal solid waste incinerators and smelters. The substitute also authorized research and development on methods to discourage exports to countries with unsafe recycling practices of recyclable materials from electronic de-

vices that could be processed into usable commodities in the United States and North America, including identification of what kind of additional specialized capacity may be needed, existing barriers to developing that capacity, and options for overcoming those barriers.

*Subsection (b)—Merit review; competition*

Summary

Subsection (b) requires that the grants be provided on a merit-reviewed, competitive basis.

*Subsection (c)—Applications*

Summary

Subsection (c) requires that a consortium submit a grant application to EPA, at such time, in such manner, and containing such information and assurances as the Administrator may require, including: (1) a description of the research project and the contributions of each of the participating entities, including the for-profit entity; (2) the applicability of the project to reduce impediments to electronic device recycling in the electronic device design, manufacturing, refurbishing, or recycling industries; (3) the potential for and feasibility of incorporating the research results into industry practice; and (4) how the project will promote collaboration among scientists and engineers from different disciplines, such as electrical engineering, materials science, and social science.

*Subsection (d)—Dissemination of research results*

Summary

Subsection (d) requires that the research results be made public through: (1) publication on EPA's website; (2) development of best practices or training materials for use in the electronic device manufacturing, design, refurbishing, or recycling industries; (3) dissemination at conferences affiliated with such industries; (4) demonstration projects; or (5) educational materials for the public produced in conjunction with State governments, local governments, or nonprofit organizations on problems and solutions related to electronic device recycling and reuse.

Discussion

The Committee expects that EPA will make all information developed through these programs that is not proprietary information or trade secrets, including research results, training materials, conference materials, educational materials, and any other information, available on its website.

*Subsection (e)—Funding contribution from for-profit member of consortium*

Summary

Subsection (e) requires that the for-profit entity participating in the consortium contribute at least 10 percent of the total research project cost, either directly or with in-kind contributions.

*Subsection (f)—Protection of proprietary information*

## Summary

Subsection (f) prohibits the disclosure of proprietary information or trade secrets provided by any person or entity under this section. Subsection (f) also requires that, as a condition of receipt of a grant under this section, each member of the consortium must have in place proper protections to maintain proprietary information or trade secrets contributed by other members of the consortium, and if any member of the consortium breaches that condition or discloses such proprietary information or trade secrets, the grant recipient may be required to return funds received under the grant.

## Discussion

The Committee appreciates and respects the legitimate need of consortia members to protect proprietary information or trade secrets. Because one of the primary purposes of this bill is to develop and promote the widespread use more environmentally preferable materials, design features, and manufacturing processes in the electronic device industry, the consideration of this goal is expected when making a determination on whether to assert or maintain a claim that such information is proprietary information or a trade secret.

*Subsection (g)—Biennial report*

## Summary

Subsection (g) requires EPA to report to Congress within 2 years of enactment, and every 2 years thereafter until Congress stops appropriating funds to carry out the program, of grants awarded, list of the research and development projects, results of projects, and a description of the rate and success of the adoption or integration of the research results into electronic device manufacturing practices, management practices, and products.

*Subsection (h)—Authorization of appropriations*

## Summary

Subsection (h) authorizes \$60 million over 3 years for the research, development, and demonstration project grant program as follows: \$18 million for fiscal year (FY) 2011; \$20 million for FY 2012; and \$22 million for FY 2013.

*Section 5. Electronic Device Engineering Research, Development, and Demonstration Projects of EPA*

## Summary

This section directs the Administrator, through an applied research program in EPA's Office of Research and Development, to conduct research for the purposes described in and on the topics listed in section 4. Section 5 authorizes \$10 million for each of FYs 2011 through 2013 for this in-house research program.

## Discussion

The scope of the in-house research to be conducted by EPA's Office of Research and Development is the same as the scope of the

research authorized to be conducted by the consortia through the grant program. The Committee expects that the grant program and the in-house research program will complement each other. The Committee has authorized appropriations for the in-house research program separately from the grant program and expects that each program shall be funded independently.

*Section 6. National Academy of Sciences report on electronic devices*

*Subsection (a)—In general*

Summary

Subsection (a) directs the Administrator to arrange a study and enter into an arrangement with the National Academy of Sciences under which the Academy will, within 1 year of enactment, provide Congress with a report on:

(1) opportunities for and barriers to increasing the recyclability of electronic devices;

(2) the environmental and human health risks posed by the storage, transport, recycling, and disposal of unwanted electronic devices;

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

(4) any regulatory or statutory barriers that may prevent the adoption or implementation of best management practices or technological innovations that may arise from the research and training programs established in this Act; and

(5) the direct and indirect economic and domestic employment impacts associated with recycling and harvesting materials from unwanted electronic devices, instead of disposing of such devices directly in landfills.

Discussion

The substitute amendment added to the scope of the Academy study an examination of the direct and indirect economic and domestic employment impacts of recycling and harvesting materials from unwanted electronic devices instead of disposing of such devices in landfills. The Committee believes that it is important for the Academy to examine how increasing the reuse and recycling of electronic devices will enhance competitiveness, and grow business opportunities and jobs in the electronic device manufacturing and recycling industries in the United States.

*Subsection (b)—Recommendations*

Summary

Subsection (b) requires that the Academy's report to Congress under subsection (a) identify gaps in the current research and training programs in addressing the opportunities, barriers, and risks relating to electronic device recycling, and recommend areas where additional research and development resources are needed to reduce the impact of unwanted electronic devices on human health and the environment.

*Section 7. Engineering curriculum development grants*

*Subsection (a)—Grant program*

Summary

Subsection (a) directs the Administrator, in consultation with the Director of the National Science Foundation, to provide grants to institutions of higher education to develop curricula that incorporate the principles of environmental design into the development of electronic devices for the training of electrical, mechanical, industrial, manufacturing, materials, and software engineers and other students at the undergraduate and graduate level, and to support the continuing education of professionals in the electronic device manufacturing, design, refurbishing, or recycling industries.

*Subsection (b)—Outreach to minority serving institutions*

Summary

Subsection (b) directs the Administrator to conduct outreach to minority serving institutions for the purposes of providing information on the grants available under this section and how to apply for such grants.

*Subsection (c)—Merit review; competition*

Summary

Subsection (c) requires that the grants be awarded on a merit-reviewed, competitive basis.

*Subsection (d)—Use of funds*

Summary

Subsection (d) requires that the grants be used for activities that enhance the ability of an institution of higher education to broaden the undergraduate and graduate-level engineering curriculum or professional continuing education curriculum to include environmental engineering design principles and consideration of product lifecycles related to electronic devices and increasing the recyclability of such devices. Activities may include:

- (1) developing and revising curriculum to include multidisciplinary elements;
- (2) creating research and internship opportunities for students through partnerships with industry, nonprofit organizations, or government agencies;
- (3) creating and establishing certificate programs; and
- (4) developing curricula for short courses and continuing education for professionals in the environmental design of electronic devices to increase the recyclability of such devices.

*Subsection (e)—Application*

Summary

Subsection (e) requires that an institution of higher education seeking a grant under this section submit an application to the Administrator at such time, in such manner, and with such information and assurances as the Administrator may require.

*Subsection (f)—Authorization of appropriations*

## Summary

Subsection (f) authorizes \$15,454,000 over 3 years as follows: \$5,000,000 for FY 2010; \$5,150,000 for FY 2011; and \$5,304,000 for FY 2012.

*Section 8. Environmentally friendly alternative materials physical property database**Subsection (a)—In general*

## Summary

Subsection (a) requires the Director of the National Institute of Standards and Technology (NIST) in conjunction with the EPA Administrator to develop a comprehensive physical property database for environmentally preferable alternative materials, design features, and manufacturing practices for use in electronic devices.

*Subsection (b)—Eligible materials, features, and practices*

## Summary

Subsection (b) requires that the Director consult the Administrator in determining whether certain materials, design features, and manufacturing practices are environmentally preferable and, therefore, should be contained in the database.

## Discussion

The Committee recognizes that there is no established, generally recognized definition of the term “environmentally preferable,” and that the determination of what is environmentally preferable can be made on a case-by case basis. The Committee also recognizes that such determinations will not be static, but will change over time as newer more environmentally preferable alternative materials, design features, and manufacturing practices are developed. In making determinations of what to include in the database, NIST will be required to consult with EPA in making a determination that materials, design features, and manufacturing practices are environmentally preferable. The Committee also expects that EPA will work with stakeholders, including industry, public health and environmental groups, in carrying out its role of providing its expert advice to NIST on the materials, design features, and manufacturing practices that are environmentally preferable and, therefore, can be contained in the database.

*Subsection (c)—Priorities*

## Summary

Subsection (c) requires the Director, working with the electronic device design, manufacturing, or recycling industries, to develop a strategic plan to establish priorities and the physical property characterization requirements for the database.

*Subsection (d)—Other matters*

## Summary

Subsection (d) allows the Director to expand the database to include information on the environmental impacts of various materials, design features, and manufacturing practices used in electronic devices from a life-cycle standpoint.

*Subsection (e)—Annual updates*

## Summary

Subsection (e) requires at least annual updates to the database.

## Discussion

The Committee expects that NIST will, in consultation with EPA, update the database more often as the results of the research and demonstration projects by the consortia and EPA become available.

*Subsection (f)—Authorization of appropriations*

## Summary

Subsection (f) authorizes \$3 million for each of fiscal years 2011 through 2013.

## LEGISLATIVE HISTORY

S. 1397 was introduced by Senators Klobuchar and Gillibrand on July 6, 2009. The bill was read twice and referred to the Senate Committee on Environment and Public Works. On December 10, 2009, the full Committee on Environment and Public Works considered S. 1397 and ordered favorably reported a substitute amendment. Senator Klobuchar made the following statement about S. 1397:

Thank you Chairman Boxer. I appreciated the time you gave me to talk about the formaldehyde bill. One other I wanted to mention that is on the mark up today that I am co-sponsoring with Senator Gillibrand who I see is here. That is the Electronic Device Recycling Research and Development Act. As you all know across the country the vast majority of discarded electronics end up in landfills or burned in garbage incinerators. This is a national and an international problem and the solutions will have to be on an equal scale if we ever hope to recycle the huge, ever-growing volume of discarded electronics. When e-waste is buried in landfills, lead and mercury can contaminate ground and surface water.

What this bill does is authorize public/private cost sharing grants to be awarded for R&D projects that aim to address this growing problem. We have worked on this bill with the Consumer Electronics Retailers Coalition. I've seen firsthand some of the work that is going on with consumer electronics to make them so that they are less damaging to the environment when they are discarded. There is a lot of recycling, obviously that we want to promote that is going on. But there is a huge amount of work to

be done. When you think of all of the electronics in this country and it is going up at such an exponential rate that we need to be on the front end of this because, as I said, it's not just a national but an international problem. I appreciate that the Consumer Electronics Association, the Electronics Take Back Coalition, and the Institute of Scrap Recycling Industries and others are on board with this legislation that Senator Gillibrand and I have. Thank you very much

#### HEARINGS

The Committee did not hold hearings on S. 1397 during the 111th Congress. On July 26, 2005, the Subcommittee on Superfund and Waste Management held an oversight hearing on "Electronic Waste."

#### ROLLCALL VOTES

There were no rollcall votes. The Committee on Environment and Public Works met to consider S. 1397 on December 10, 2009. A quorum of the Committee being present, S. 1397 was reported favorably as amended by a voice vote.

#### REGULATORY IMPACT STATEMENT

In compliance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee states that there are not expected to be significant costs to private entities under this legislation.

#### MANDATES ASSESSMENT

In compliance with the Unfunded Mandates Reform Act of 1995 (public Law 104-4), the Committee finds that S. 1397 would impose no Federal intergovernmental unfunded mandates on State, local, or tribal governments.

DECEMBER 14, 2009.

Hon. BARBARA BOXER,  
*Chairman, Committee on Environment and Public Works,*  
*U.S. Senate, Washington, DC.*

DEAR MADAM CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for S. 1397, the Electronic Device Recycling Research and Development Act.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Susanne S. Mehlman.

Sincerely,

DOUGLAS W. ELMENDORF.

Enclosure.

#### CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

In compliance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office.

*S. 1397—Electronic Device Recycling Research and Development Act*

Summary: S. 1397 would authorize appropriations for the Environmental Protection Agency to provide grants to consortia and institutions of higher education to support research and projects related to the recycling of electronic devices, such as computers, printers, and copiers. This legislation also would authorize appropriations for the National Institute of Standards and Technology (NIST) to develop a database of alternative materials for use in electronic devices and for EPA to conduct its own engineering research and demonstration projects.

CBO estimates that implementing S. 1397 would cost \$14 million in 2011 and \$109 million over the 2011–2014 period, assuming appropriation of the authorized amounts. Enacting the bill would not affect direct spending or revenues.

S. 1397 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA). Any costs to state, local, or tribal governments would result from complying with conditions of assistance.

Estimated cost to the Federal Government: The estimated budgetary impact of S. 1397 is shown in the following table. The costs of this legislation fall within budget functions 300 (natural resources and environment) and 370 (commerce and housing credit).

	By fiscal year, in millions of dollars—					
	2010	2011	2012	2013	2014	2010–2014
CHANGES IN SPENDING SUBJECT TO APPROPRIATION						
Grants to Consortia to Address Environmental Impact of Electronic Devices:						
Authorization Level .....	0	18	20	22	0	60
Estimated Outlays .....	0	7	16	21	13	57
Funding to Support Engineering Research and Demonstration Projects:						
Authorization Level .....	0	10	10	10	0	30
Estimated Outlays .....	0	4	9	10	6	29
Grants to Develop Engineering Curriculum:						
Authorization Level .....	0	5	5	5	0	15
Estimated Outlays .....	0	2	4	5	3	15
NIST Database Development:						
Authorization Level .....	0	3	3	3	0	9
Estimated Outlays .....	0	1	3	3	2	9
Total Proposed Changes:						
Authorization Level .....	0	36	38	40	0	114
Estimated Outlays .....	0	14	32	39	24	109

Note: NIST = National Institute of Standards and Technology.

Basis of estimate: For this estimate, CBO assumes that S. 1397 will be enacted before the end of 2010, that the specified amounts will be appropriated in each year starting in 2011, and that outlays will follow historical spending patterns for similar programs. CBO estimates that implementing this legislation would cost \$109 million over the 2011–2014 period.

Intergovernmental and private-sector impact: S. 1397 contains no intergovernmental or private-sector mandates as defined in UMRA. The bill would provide grants to institutions of higher education, including public colleges and universities, to conduct research and develop curricula related to improving the recycling of electronic devices. Any costs to state, local, or tribal governments would result from complying with conditions of federal assistance.

Previous CBO cost estimate: On March 30, 2009, CBO transmitted a cost estimate for H.R. 1580, the Electric Device Recycling Research and Development Act, as ordered reported by the House Committee on Science and Technology on March 25, 2009. Both pieces of legislation are similar, though S. 1397 includes an additional authorization of appropriations for EPA to fund its own engineering research and demonstration projects. That difference between the two pieces of legislation is reflected in CBO's cost estimates.

Estimate prepared by: Federal Costs: Susanne S. Mehlman; Impact on State, Local, and Tribal Governments: Ryan Miller; Impact on the Private Sector: Amy Petz.

Estimate approved by: Theresa Gullo, Deputy Assistant Director for Budget Analysis.

#### CHANGES IN EXISTING LAW

Section 12 of rule XXVI of the Standing Rules of the Senate requires the Committee to publish changes in existing law made by the bill as reported. Passage of this bill will make no changes to existing law.

