NATIONAL STRATEGY FOR ELECTRONICS STEWARDSHIP

JULY 20, 2011

INTERAGENCY TASK FORCE ON ELECTRONICS STEWARDSHIP

Co-Chairs:

White House Council on Environmental Quality

Environmental Protection Agency

General Services Administration

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EXECUTIVE SUMMARY

From computers and cell phones, to portable communication and music devices -- the United States of America is, and will continue to be, a global leader in designing and developing new and improved electronic technologies. These technologies have become critical to our way of life and to our growing economy. With these technologies, however, comes the increasing challenge of protecting human health and the environment from the harmful effects associated with the unsafe handling and disposal of these products. Meeting this challenge will require a new strategy for electronics stewardship – one that is innovative, flexible, and pragmatic – that allows Americans to manage the electronics we use today more sustainably, and simultaneously promotes the new and innovative technologies of the future. Innovation is woven throughout America's history and culture and is an asset we must employ to find solutions to the challenges we face today to sustainably manage our electronics.

Some of the problems caused by the mismanagement of used electronics create an opportunity for individuals, communities, non-governmental organizations (NGOs), businesses, local governments, states, tribal nations, and the Federal Government to work together toward becoming better stewards of the global environment. Better management of electronics through the product lifecycle – from design and manufacturing through their use and eventual recycling, recovery, and disposal – is an opportunity to prevent environmental harm, conserve valuable resources, save money, create jobs, and invest in our economic development.

By implementing the recommendations presented in this National Strategy for Electronics Stewardship, developed by an interagency Task Force, the Federal Government will lay the groundwork for improving the design of electronic products and enhancing our management of used or discarded electronics. This Strategy provides a roadmap of how the Federal Government can use its authorities and leverage resources to seize this opportunity.

Summary of Recommendations

The National Strategy for Electronics Stewardship provides four overarching goals, the action items under each goal, and the projects that will implement each action item. These recommendations are summarized below and described in more detail in the main body of this document.

Build Incentives for Design of Greener Electronics, and Enhance Science, Research and Technology Development in the United States

- **Establish multi-stakeholder groups to address key research questions and design challenges, and accelerate development of and investment in green electronics design standards.**
- **Promote consumer purchasing of green electronics that are certified as meeting stringent environmental performance criteria that address environmental impacts across the entire lifecycle of the products.**
- **Promote scientific research and technological developments that improve our ability to recover and market valuable materials from used electronics, especially precious metals and rare earth elements.**
- **Launch electronics stewardship prize competitions to stimulate innovations in green product design, recycling solutions, and other phases of the electronics lifecycle.**
- **Ensure expansion of quality green electronics certification programs, including EPEAT, [1] to consider environmental impacts across entire product lifecycles and to cover additional types of electronics.**

Ensure that the Federal Government Leads By Example

- **Establish a comprehensive and transparent government-wide policy on used Federal electronics that maximizes reuse, clears data and information stored on used equipment, and ensures that all Federal electronics are processed by certified recyclers.**
- **Encourage electronics manufacturers to expand their product take-back programs, and use certified recyclers as a minimum standard in those programs, by expanding the use of manufacturer take-back agreements in Federal electronics purchase, rental and service contracts.**
- **Require and enable recipients of former Federal equipment that has been sold, transferred, or donated for reuse to use certified recyclers and follow other environmentally sound practices to the greatest extent possible.**
- **Improve tracking of used Federal electronics throughout the lifecycle and post comprehensive data sets on Data.gov and other publicly accessible websites.**

[1] Electronic Product Environmental Assessment Tool

- **More effectively direct Federal Government spending on electronics toward green products through procurement changes.**
- **Expand the use of the intergovernmental cooperative agreements between the US Postal Service and other federal agencies to make it more convenient, efficient, and cost effective for government agencies with remote offices to directly ship used electronics to original equipment manufacturers, certified recyclers, or entities that will reuse the equipment.**
- **Identify, characterize, and document markets, as well as market and financial assistance opportunities, associated with managing and recycling used electronics.**

Increase Safe and Effective Management and Handling of Used Electronics in the United States

- **Launch voluntary partnerships with the electronics industry.**
- **Provide guidance to electronics recycling employers on providing facilities that offer safe and healthy working environments.**
- **Establish approaches to gather, track, and provide public access to information on quantities and movement of used electronics within the US.**

Reduce Harm from US Exports of E-Waste and Improve Safe Handling of Used Electronics in Developing Countries

- **Improve information on trade flows and handling of used electronics, and share data with Federal and international agencies, within the limits of existing legal authorities.**
- **Provide technical assistance and establish partnerships with developing countries to better manage used electronics.**
- **Work with exporters to explore how to incentivize and promote the safe handling of remanufactured, recycled, and used electronics at home and abroad.**
- **Propose regulatory changes to improve compliance with the existing regulation that governs the export of cathode ray tubes from used computer monitors and televisions that are destined for reuse and recycling.**
- **Support ratification of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.**

An on-line annex of benchmarks of projects, posted on the Web at www.fedcenter.gov, lists each of the projects, the primary agency responsible for the project and any agencies supporting the primary agency in that effort, and the target date for completion of the project. As the National Strategy is developed in further detail by the departments and agencies, and as the Strategy is implemented, the annex will be updated. As appropriate, action items and projects under them may be realigned as efficiencies and opportunities for further improvement are identified.

INTRODUCTION

From computers and cell phones, to portable communication and music devices -- the United States of America is, and will continue to be, a global leader in designing and developing new and improved electronic technologies. These technologies have become critical to our way of life and to our growing economy. With these technologies, however, comes the increasing challenge of protecting human health and the environment from the potentially harmful effects associated with the improper handling and disposal of these products. Currently, most discarded consumer electronics end up in our landfills.[2] While accurate data on the amount of e-waste being exported from the US are not available, the Federal Government is concerned that these exports may be mismanaged abroad,[3] causing serious public health[4] and environmental hazards[5] and representing a lost opportunity to recover valuable resources.

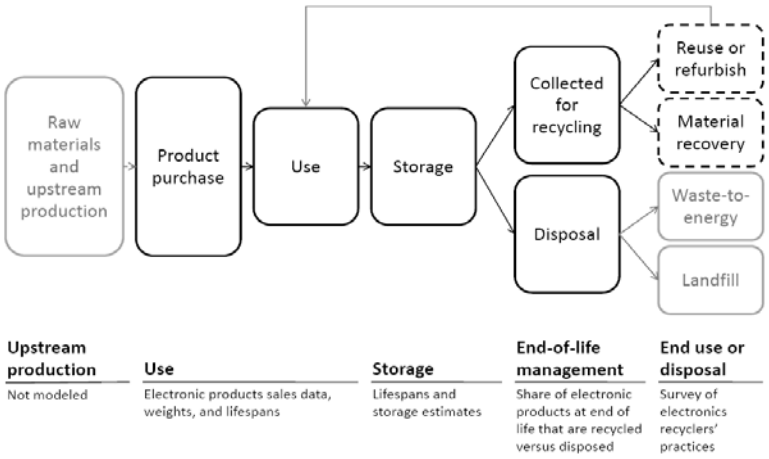

Figure 1: Life-cycle flow chart for electronic products. Solid boxes refer to life cycle stages modeled by the EPA in 2011; dashed and gray boxes refer to stages where information was collected by recycler surveys, or that were not in 2011 modeled. See footnote 2.

Increasing the capacity to carry out recycling, refurbishing, and remanufacturing activities in the US could generate opportunities for US-based green jobs, and increase exports of

[2] EPA. Electronics Waste Management in the United States through 2009. EPA 530-R-11-002, May 2011; www.epa.gov/epawaste/conserve/materials/ecycling/docs/fullbaselinereport2011.pdf.
[3] See, e.g., eCycling Frequent Questions, www.epa.gov/epawaste/conserve/materials/ecycling/faq.htm; Cleaning Up Electronic Waste, www.epa.gov/international/toxics/ewaste.html; CEC Projects on Electronics Waste, www.epa.gov/international/regions/na/nacec/cecewaste.html.
[4] Yang F, Jin S, Xu Y, Lu Y. Comparisons of IL-8, ROS and p53 responses in human lung epithelial cells exposed to two extracts of PM2.5 collected from an e-waste recycling area, China. Environmental Research Letters 6(2) 024013, May 31, 2011; http://iopscience.iop.org/1748-9326/6/2/024013.
[5] Tsydenova O, Bengtsson M. Chemical hazards associated with treatment of waste electrical and electronic equipment. Waste Management 31(1) 45–58, January 2011; www.sciencedirect.com/science/article/B6VFR-5132N42-1/2/b6df41a27003a9c5b8b08ef4a85b4712.

remanufactured electronic goods. For example, the National Export Initiative highlights opportunities for domestic job creation through increased exports. Increased domestic recycling that includes sorting, dismantling, and recovery of valuable materials could also spur the development of better and more efficient recycling technologies. Improved lifecycle management of electronics, through refurbished and remanufactured electronic goods can also reduce total quantities of waste to be managed, both domestically and globally.

Meeting this challenge will require a new national strategy for electronics stewardship – one that is innovative, flexible, and pragmatic – that allows Americans to manage the electronics we use today more sustainably, while simultaneously promotes the new and innovative technologies of the future. Innovation is woven throughout America's history and culture, and American innovation is an asset we must employ to meet the challenges we face today to sustainably manage our electronics.

As global leaders, many American companies have been working to improve the way electronics are designed and managed by using more environmentally-preferable materials and finding better ways to reuse, refurbish and recycle. As responsible consumers, more and more Americans understand the human health and environmental hazards of improper handling and disposal, and are already taking some steps to buy greener products and safely recycle discarded electronics. Although the Task Force recognizes and appreciates the importance of these early efforts, it is convinced that the Nation needs to do much more.

Used Electronics *versus* E-Waste

"E-waste," "electronic waste," "electronics waste," "e-scrap," and "end-of-life electronics" are terms that are often used to describe used electronics that are nearing the end of their useful life, and are discarded, donated or given to a recycler. The Task Force recognizes that the term "e-waste" and similar terms are commonly used in many parts of the world. For the purposes of this document, however, the Task Force considers "e-waste" a subset of "used electronics." Used electronics can be reused, refurbished, and recycled, and can be a source of valuable parts and/or raw materials (e.g., gold, copper, glass), which can be returned to the supply chain to reduce overall waste. There is a general acknowledgement globally that some used electronics are exported to developing countries where they are not managed properly, and become e-waste.

The use of the term "e-waste" is intentionally minimized in this document simply to emphasize the importance of reuse and responsible recycling. Reuse of used electronics will reduce the amount of waste generated, and proper recycling of used electronics can yield raw materials (e.g., gold, copper, glass, aluminum) that can produce an economic benefit as well as serve to return materials to the supply chain and reduce overall waste. It should be noted that many countries have their own definitions, policies, and laws regarding management of used electronics and e-waste, including import and export restrictions.

Resource Conservation and Recovery Act (RCRA)

This 1976 Federal law authorizes EPA to protect public health and the environment against many kinds of waste that is disposed of or recycled in certain ways. However, electronic devices sent for reuse for their original purpose (i.e., electronics sold or donated to be used again) are not "waste" governed by RCRA. Although EPA has issued a rule under RCRA for cathode ray tubes (CRTs) (see pages 29-30), which have high lead content, electronic devices are complex and consist of a wide variety of materials, many of which would not be classified as hazardous under RCRA regulations. In particular, the "CRT rule" encourages recycling and reuse of used CRTs and glass removed from CRTs. The rule excludes these materials from the RCRA definition of solid waste if certain conditions are met.

Urban Mining

"Urban mining" refers to the recovery of precious metals and other valuable materials from products or what some people consider waste, as opposed to mining of minerals from ores, or drilling of petroleum or other organics, in the ground. Reusing and recycling unwanted electronics helps the environment by saving energy and keeping valuable materials out of landfills. Electronics are made out of precious metal, copper, plastics and glass, all of which require energy to mine and manufacture. Recycling not only conserves these materials, but reduces air and water pollution, erosion, and greenhouse gas emissions.

In proclaiming November 15, 2010 as America Recycles Day, President Obama stated that Americans must build upon this progress and increase our capacity to recycle our used electronics responsibly. Increasing our domestic recycling efforts can create green jobs, can lead to more productive reuse of valuable materials, increase the value of American exports, and support a vibrant American recycling and refurbishing industry. If done properly, we can increase our domestic recycling efforts, reduce harm from exports of e-waste being handled unsafely in developing countries, strengthen domestic and international markets for viable and functional used electronic products and prevent health and environmental threats at home and abroad.

To seize these opportunities and address the problems caused by discarded used electronics, the White House Council on Environmental Quality (CEQ), acting under Executive Order (EO) 13514,[6] and building on previous EOs,[7] established the Interagency Task Force on Electronics Stewardship, co-chaired by the Environmental Protection Agency (EPA) and the General Services Administration (GSA), as well as CEQ, to develop a national strategy that builds upon existing Federal Government efforts and incorporates recommendations proposed by electronics stakeholders and the public.[8]

This *National Strategy for Electronics Stewardship* provides recommendations on steps the Federal Government, businesses, and all Americans can take toward achieving the goals identified by President Obama. The following agencies and departments contributed to this National Strategy and participated in drafting the recommendations:

- **White House Council on Environmental Quality**
- **Environmental Protection Agency**
- **General Services Administration**
- **Office of Management and Budget**
- **Office of the US Trade Representative**
- **Department of Commerce**
- **Department of Defense**
- **Department of Education**
- **Department of Energy**
- **Department of Labor**
- **Department of Justice**
- **Department of State**
- **Department of Veterans Affairs**
- **Federal Communications Commission**
- **US Customs and Border Protection**
- **US Postal Service**

On behalf of the Task Force, EPA solicited public comment from stakeholders through a notice published in the *Federal Register*;[9] about 130 unique sets of comments were received in response to the notice, including 2050 letters from a mail-in campaign. Also on behalf of the Task Force, CEQ held three stakeholder listening sessions in March 2011 with State and local government agencies, non-governmental organizations, and industry, respectively. Comments provided through both of these methods were evaluated by the Task Force and considered in developing the strategy. Additional consideration to comments received in drafting this National Strategy will be given during the implementation of the Task Force recommendations.

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[6] Executive Order (EO) 13514, Federal Leadership in Environmental, Energy, and Economic Performance (October 5, 2009). http://edocket.access.gpo.gov/2009/pdf/E9-24518.pdf.

[7] These previous EOs include EO 12780, Federal Agency Recycling and the Council on Federal Recycling and Procurement Policy (October 31, 1991); EO 12873, Federal Acquisition, Recycling, and Waste Prevention (October 20, 1993); EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management (January 24, 2007); and EO 13534, National Export Initiative (March 11, 2010). EOs issued since 1937 are available through www.archives.gov/federal-register/executive-orders/disposition.html.

[8] Task Force establishment letter, November 8, 2011, www.epa.gov/osw/conserve/materials/ecycling/docs/ewaste_task_force_memo.pdf.

[9] 76 Federal Register (FR) 11243-44; March 1, 2011; http://federalregister.gov/a/2011-4505. EPA later extended the March 11 deadline to March 16. The FR notice and the public submissions responding to the notice are available (as of the publication of this report) at www.regulations.gov by entering "EPA-HQ-RCRA-2011-0185" (either with or without the quotes) in the Enter Keyword or ID window.

THE NATIONAL STRATEGY FOR ELECTRONICS STEWARDSHIP

Build Incentives for Design of Greener Electronics, and Enhance Science, Research and Technology Development in the United States

Our responsibility to manage electronics depends on our ability to innovate, find new methods to reuse and recycle, and design greener products that have reduced environmental impacts across their lifecycles and are easier to recycle. Specifically, greener and more sustainable electronics may include the following characteristics:

- **They contain recycled materials and fewer hazardous and virgin materials.**
- **They include lists of intentionally added chemicals, generated by suppliers and manufacturers, which are available to certifying bodies, as necessary.**
- **They are capable of being recycled to maximize the recovery of the rare or valuable materials they contain and minimize the amount of waste, especially hazardous waste, they could ultimately generate.**
- **They are energy efficient through the product lifecycle.**
- **They are designed to have long useful lives and facilitate reuse through multiple users.**
- **They generate minimal emissions which are harmful to public health or the environment during the manufacturing, use, recycling, and disposal phases.**

The rapidly growing interest among business and consumers in more-sustainable electronics and other products presents opportunities for the Federal Government to lead and achieve major economic, energy, environmental, and public health improvements. Major advances in electronics design, including flexible electronics, offer new opportunities to design sustainability into the lifecycle of electronics.

Many companies, NGOs, and other stakeholders are calling on the Federal Government to provide greater leadership in product sustainability, looking to the government's technical and policy expertise, program experience, and overall credibility. Currently the Federal Government is promoting greener design and more sustainable use of electronics through the EPA–Department of Energy (DOE) ENERGY STAR program,[10] DOE's Federal Energy

[10] Energy Star Program, www.energystar.gov.

Management Program (FEMP),[11] and use of the Electronic Product Environmental Assessment Tool (EPEAT)[12] programs. These programs help the Federal Government and private consumers identify and purchase greener electronics, and provide a solid foundation to build more efforts to encourage the design, manufacture, and purchase of green electronics. Currently, the government uses these programs to guide its procurement of green electronics and has aggressive green purchasing mandates (notably the goal of 95% of sustainable acquisitions specified in Executive Order 13514).[13] However, there are large gaps in its data and ability to demonstrate performance against those mandates, especially outside of the product categories covered by the EPEAT program.

The Federal Government can help drive improved electronic product design, manufacture, and technology development in a variety of ways. The Interagency Task Force has identified steps to advance green design and ensure that better design standards are supported by consumer demand and are economically viable.

- **Establish multi-stakeholder groups to address key research questions and design challenges, and accelerate development of and investment in green electronics design standards.**

  EPA has a unique ability to bring diverse groups of stakeholders to the table to address common challenges. There are several opportunities for EPA to use its influence to advance the state of green electronics design by convening multi-stakeholder groups with the goals of:

  - Developing a shared vision of what truly sustainable electronics should look like, and providing clear end-goals for design standards development.
  - Promoting the integration of end-of-life considerations into front-end product designs.
  - Extending the useful life of electronic products, and assessing the optimal amount of time to keep products in operation.
  - Supporting the creation of environmental criteria for refurbished equipment.
  - Addressing other high-priority questions and challenges identified by the stakeholder community.

[11] Federal Energy Management Program, http://www1.eere.energy.gov/femp/.
[12] Green Electronics Council. Electronic Product Environmental Assessment Tool, www.epeat.net.
[13] EO 13514, http://edocket.access.gpo.gov/2009/pdf/E9-24518.pdf, section 2(h).

EPA, in cooperation with GSA, will support convening of multi-stakeholder groups, including electronic product designers, refurbishers, recyclers, NGOs, and academic and other technical experts to address those and other challenges. The Federal Government will consider joining or supporting industry initiatives when appropriate.

- **Promote consumer purchasing of green electronics that are certified as meeting stringent environmental performance criteria that address environmental impacts across the entire lifecycle of the products.**

  Advancing the state of green electronics design will not have any long term effect if consumers do not purchase green electronics. As the Federal Government directs its purchasing toward electronics that meet ENERGY STAR, EPEAT, and other standards, it should also encourage private consumers to adopt green electronics certifications in their purchasing decisions.

  EPA will initiate an outreach program to encourage purchasing of green electronic by private consumers.

  EPA will encourage consumer procurement of products that are EPEAT registered and will continue supporting ENERGY STAR program outreach to consumers.

  EPA will launch a Greener Products Website to help consumers more easily find information on greener products.

- **Promote scientific research and technological developments that improve our ability to recover and market valuable materials from used electronics, especially precious metals and rare earth elements.**

  Currently, there is limited, but growing, domestic capacity in the US to recover valuable materials from used electronics (e.g., precious and rare earth metals). Used electronics in the US are often exported to facilities outside the US that are capable of extracting these materials.[14] Increased domestic recovery capacity has the potential to stimulate investment and the creation of jobs in the reuse and recycling industries. Some of the challenges to investing in domestic capacity include development of advanced techniques for metal/material recovery, the cost of such a facility, and reliability of a stream of source material for recycling/recovery.

[14] Per preliminary results from an industry survey focusing on R2 certified recycling firms in 2010. Eric Harris, presentation on 2011 Electronics Recycling Survey (Preliminary Report), Institute of Scrap Recycling Industries, Inc., April 7, 2011; summarized at www.isri.org/iMIS15_PROD/ISRI/Whats_New/ISRI_Unveils_Preliminary_Findings_from_2011_Electronics_Recycling_Industry_Survey.aspx.

At the same time, there are numerous federal programs to support technology innovation, economic development, and advanced manufacturing, as well as state and local programs to promote economic and workforce development. These programs could support the development of a more robust domestic electronics recycling industry.

The Federal Electronics Stewardship Working Group (FESWG)[15] helps develop Federal policies, guidance, reporting metrics and other documents in support of EO 13514, and is a forum for information exchange and coordination on electronics stewardship. The Interagency Sustainable Acquisition and Materials Management Practices Workgroup (SAMM)[16] helps to identify, characterize, and document markets and market opportunities associated with acquisition, materials management and recycling. In conjunction with improved tracking of electronics products, improved understanding of the market opportunities for electronics recycling would facilitate development and implementation of improved approaches and policies for managing Federal used electronics, encourage domestic development and investment in these market opportunities, and discourage production of e-waste.

In order to meet US environmental and economic goals, EPA will lead an interagency effort, involving the Department of Defense, Department of Energy, and the Department of the Interior's US Geological Survey, and in partnership with FESWG and SAMM and those workgroups' member agencies, to explore and develop recommendations for identifying and addressing market, financial, and regulatory barriers to investment in domestic material recovery from used electronics.

To address health issues and challenges regarding recovery of rare earth elements, EPA will support research into the toxicology, exposure pathways, and recovery methodologies of the rare earth elements (and their compounds) used in electronics and during their recycling, remanufacturing and disposal.

[15] FESWG is convened by Office of the Federal Environmental Executive (OFEE).
[16] SAMM is convened by the OFEE.

- **Launch electronics stewardship prize competitions to stimulate innovations in green product design, recycling solutions, and other phases of the electronics lifecycle.**

  The America COMPETES Reauthorization Act of 2010[17] gave every Federal agency the authority to conduct prize competitions to accelerate problem-solving by tapping America's top talent and best expertise wherever it may lie. In particular, the Act authorizes agencies to use not only Federal funds for cash and other prizes, and for prize programs' design and administration, but also private sector funds for cash prizes and prize program design and administration. The opportunity to leverage private-sector funds to provide prize purses is a particularly important one for the government in the current and projected fiscal climate, and prize competitions can be effectively applied to design and systems challenges across the electronics lifecycle.

  EPA, in cooperation with GSA, CEQ and the Office of Science and Technology Policy (OSTP) and relevant agencies, will launch the development of a series of prize competitions and leverage private sector and philanthropic support for awards to spur innovations in technology and design to be applied across the lifecycle of electronics.

  EPA, GSA CEQ and OSTP will, as part of developing these competitions, coordinate with other agencies to initiate the solicitation of public comment on how to most effectively target limited prize resources toward the highest-impact challenges.

- **Ensure expansion of quality green electronics certification programs, including EPEAT, to consider environmental impacts across entire product lifecycles and to cover additional types of electronics.**

  Existing green electronics programs, including ENERGY STAR and EPEAT, help Federal and private consumers identify and purchase greener electronics that are held to transparent standards. Although these programs encourage green design and drive Federal purchasing toward more sustainable products, they can be improved to cover additional electronics products and to identify the lifecycle impacts that electronics have on the environment.

  There is an opportunity, especially in the EPEAT program, which currently only covers laptops, desktops and monitors, to expand and become more robust at a faster rate with more support from key Federal agencies.

[17] Public Law 111-358, section 105, Prize Competitions; 15 U.S.C. § 3719; www.gpo.gov/fdsys/pkg/PLAW-111publ358/html/PLAW-111publ358.htm.

EPA will support and engage in development of new standards addressing products not covered by EPEAT, and include stakeholder input into standards development.

GSA will join the EPEAT standard development process to represent the interests of the Federal Government as a consumer.

The Task Force also supports EPA's efforts to expand the ENERGY STAR program beyond its focus on energy consumed by electronics while in use. For many of the electronics products covered by the ENERGY STAR program, EPA is exploring the possibility of expanding its specifications to include energy outside the use phase and other environmental aspects as appropriate.

GSA and EPA, building upon existing Federal Government efforts, such as the Interagency Sub-Working Group on Standards and Ecolabeling operating under Section 13 of EO 13514, to develop guidance for selecting environmental standards and ecolabels in Federal procurement, will identify any additional standards and eco-labels to include in expanded green electronics certification programs, and additional programs in which Federal participation should be considered.

Ensure that the Federal Government Leads By Example

As one of the largest consumers of electronics, the Federal Government has the particular opportunity and responsibility to purchase, use, and recycle its electronics with the goals of: protecting public health and the environment; creating new and strengthening existing markets for reused, refurbished, and recycled electronic equipment and materials; expanding opportunities for domestic job creation; improving electronics design and management practices; and safeguarding data.

The Federal Government will lead by example in this effort by ensuring that it is the Nation's most responsible consumer of electronics. This approach will bring an unprecedented level of transparency to the Federal Government's efforts and waste stream, so private organizations and consumers can learn from its successes and highlight opportunities for improvement. The Federal Government will leverage its purchasing power to drive the electronics manufacturing and recycling industries toward more sustainable products and practices.

Through the following efforts, the Federal Government will foster improved electronics stewardship at home and abroad:

- **Establish a comprehensive and transparent government-wide policy on used Federal electronics that maximizes reuse, clears data and information stored on used equipment, and ensures that all Federal electronics are processed by certified recyclers.**

  The Federal Government generates the most used electronics in the US, resulting, in part, from its efforts to meet the ever increasing needs of citizens and businesses in an ever more efficient manner, which requires contemporary electronic equipment. The Federal Government currently follows a policy to employ environmentally sound disposition practices when handling excess Federal electronics and has several programs to encourage reuse, including the GSA Xcess® website,[18] through which agencies register excess property and search for opportunities for its reuse by other Federal agencies and eligible state and local recipients, and the Computers for Learning[19] program, through which agencies donate used computers to schools and many eligible educational non-profit organizations. The Interagency Task Force has identified many opportunities to improve these programs and the policies under which agencies use them as well as opportunities to develop new programs where appropriate.

  GSA will issue, through interagency collaboration and with public input, a revised Federal Electronics Stewardship Policy to bring Federal management of used electronics in line with current best practices; these include:

  - *Division of functional and nonfunctional equipment into distinct streams, where:*
    - *Functional equipment is directed through the government's current hierarchy of reuse opportunities: transfer to Federal agencies, donation to schools, transfer to eligible state and non-profit organizations, or sale to private consumers; and*
    - *Non-functional equipment is directed to third-party certified recyclers or refurbishers, or to manufacturer take-back programs that use certified recyclers;*
  - *Consistent practices to wipe hard drives and other storage devices, in order to protect sensitive data and maximize reuse potential by using least-destructive sanitization procedures wherever appropriate;*

[18] GSA Xcess® website, http://gsaxcess.gov/.
[19] Computers for Learning. http://computersforlearning.gov/. The program evolved as a guide for implementing EO 12999, Educational Technology: Ensuring Opportunity for all Children in the Next Century, http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=1996_register&docid=fr19ap96-137.pdf.

- *Prohibition of sale of non-functional equipment through public auctions, except to certified recyclers or refurbishers; and*
- *A landfill ban on used Federal electronics.*

Along with the revised Federal Electronics Stewardship Policy, GSA will propose revisions to the relevant sections of the Federal Management Regulation,[20] in addition to revisions already pending to the Federal Acquisition Regulations,[21] and related guidance documents. The revised Federal electronics policy and regulations will build on existing Federal programs to promote electronics reuse and recycling, clearly define what Federal agencies must do to comply with their electronics stewardship requirements under EOs 13423 and 13514, and work toward GSA's long-term goal of hosting all agencies' asset management systems on one shared, cloud-based system, once funding for such a system is available. The revised policy will include a requirement that Federal agencies only dispose of non-functional electronic equipment using contracts with sales or sales to refurbishers or recyclers certified under an accredited, third-party electronics recycler certification program,[22] or manufacturer take-back programs that utilize refurbishers or recyclers certified under such a certification program.

EPA, in consultation with and support from GSA and other relevant departments and agencies, will develop a baseline set of criteria to be included, at a minimum, in electronics recycling standards that are to be used in managing the Federal Government's used electronics.

This baseline list of criteria will cover such basic principles as: developing and implementing an environmental, health and safety management system; complying with applicable environmental, health and safety requirements; promoting reuse and recycling over disposal; and ensuring that all downstream handlers of the used electronics, including handlers of e-waste, manage these materials in a way that protects the environment, public health and worker safety. Once developed, the full list of criteria will be made publicly available.

In addition, to ensure that the Federal Government's used electronics are properly managed, EPA, in collaboration with GSA, will investigate with the applicable

[20] GSA Federal Management Regulation, www.gsa.gov/portal/category/21221.
[21] Federal Acquisition Regulation, www.acquisition.gov/far/index.html. Interim Federal Acquisition Regulation; Sustainable Acquisition, 76 FR 31395-31402; May 31, 2011; www.gpo.gov/fdsys/pkg/FR-2011-05-31/pdf/2011-12851.pdf. See, especially, interim FAR section 39.101(b)(1) on electronic stewardship requirements for acquiring information technology, and its discussion in the rulemaking preamble at p. 31396.
[22] See the discussion of certification on pp. 21-22.

accreditation board the need to initiate a study of the implementation of the current used electronics certification programs. This review will be repeated as needed, and will evaluate such aspects of the certification programs as: vigorousness of facility and downstream audits; consistency and frequency of audits; and auditor training.

GSA will consider the published criteria, the results of the implementation study, and other requirements and considerations when determining which certification programs satisfy agencies' requirements to use certified recyclers under the revised Federal Electronics Stewardship Policy.[23] GSA will make this initial determination once the regulations implementing the revised Federal Electronic Stewardship Policy are in place, and re-evaluate that determination every three years at a minimum thereafter.

- **Encourage electronics manufacturers to expand their product take-back programs, and use certified recyclers as a minimum standard in those programs, by expanding the use of manufacturer take-back agreements in Federal electronics purchase, rental and service contracts.**

  Many electronics manufacturers have created product take-back programs, where they dispose of used equipment after taking it back from customers, either on a voluntary basis or through one of the many state or tribal recycling programs. Electronics procurements (for this document, this refers to purchases, rentals and service contracts) are sometimes made from manufacturers who have committed to provide take-back services to customers as part of demonstrating the product's conformance to the standards used by the EPEAT certification program.[24]

  Many federal procurement actions involve procuring a service, not a product. For example, many federal agencies have Print Management Service Contracts under which they lease multifunction copiers in order to procure the service of being able to print documents. Under these lease agreements or service contracts, the products return to the manufacturer at the end of their useful life or the end of the contract. These lease agreements can be improved to require any products taken back by the manufacturer to be evaluated for reusability and any nonfunctioning equipment to be sent to a recycler which is certified for recycling. Expanding the use of take-back agreements

[23] These programs may be domestic, foreign, and/or international. See Office of Management and Budget, Circular A-119 Revised, Federal Participation in the Development and Use of Voluntary Standards, February 10, 1998; www.whitehouse.gov/omb/circulars_a119/.

[24] One of the minimum requirements manufacturers must meet to achieve EPEAT certification of their products is to make take-back services available to their first-tier institutional users. IEEE Standard 1680.1, IEEE Standard for Environmental Assessment of Personal Computer Products, Including Notebook Personal Computers, Desktop Personal Computers, and Personal Computer Displays, section 4.6.1.1, Provision of product take-back service; see www.epeat.net/Criteria.aspx#criteriatable and www.epeat.net/Docs/Summary%20of%20EPEAT%20Criteria.pdf.

in Federal procurement will incentivize industry to increase remanufacture and environmentally responsible recycling of those products, as well as provide additional avenues for the users and re-users of Federal equipment to dispose of equipment no longer in use safely.

GSA will begin to pilot the use of manufacturer take-back agreements in additional electronic product categories through purchases it makes for GSA operations and changes to its internal purchasing policies, with the goal of developing guidelines for how all Federal agencies should include take-back agreements in all electronics purchases, as well as criteria to include in those agreements to ensure that manufacturers follow sound disposition practices when handling taken-back equipment, including the use of certified recyclers and those state and tribal recycling programs that use certified recyclers. GSA will develop the take-back agreements guidance through interagency collaboration and with public input.

- **Require and enable recipients of former Federal equipment that has been sold, transferred, or donated for reuse to use certified recyclers and follow other environmentally sound practices, to the greatest extent possible.**

  Like almost all equipment owners, the Federal Government currently has little knowledge of, or influence over, how its downstream re-users (first-tier, second-tier, etc.) handle or dispose of surplus equipment when that equipment has reached the end of its useful life. When organizations or individuals purchase excess or surplus Federal equipment, or receive surplus equipment through transfer of donation programs (e.g., Computers for Learning[25]), they are not obliged to handle that equipment in an environmentally sound manner, nor are they typically provided the information about resources needed to do so.

  The Federal Government has the opportunity to encourage and facilitate the proper recycling of electronic equipment at end of life and ensure that all Federal equipment is recycled properly, while preserving the opportunity for non-Federal entities, especially schools, to reuse Federal equipment at low- or no-cost, by requiring, wherever possible, its downstream re-users to follow the same requirements as Federal agencies disposing of non-functional equipment.

[25] GSA Computers For Learning Program, http://computersforlearning.gov/.

GSA, in coordination with EPA, DoD, and others as appropriate, will issue guidance to Federal agencies on how to incorporate requirements for sound disposition practices, including the use of certified recyclers, into the agreements signed by recipients of sold, donated, or transferred Federal used electronics. Those requirements will mirror those placed on Federal agencies handling end-of-life equipment under the revised Federal Electronics Stewardship Policy and, to the greatest extent practicable, make the same options available to Federal agencies for disposition of equipment (e.g., manufacturer take-back or Federal refurbishment or recycling programs) available to these recipients.

GSA, EPA, DoD, and other agencies as appropriate will develop educational materials for those recipients of Federal used electronics so they understand their obligations and how to fulfill them, with the first materials issued concurrently with the sound disposition practices guidance.

- **Improve tracking of used Federal electronics throughout the lifecycle and post comprehensive data sets on Data.gov and other publicly accessible websites.**

  The current Federal tracking and reporting framework for electronic equipment does not collect data on all of the different streams of used electronics leaving Federal ownership, nor does it collect comprehensive data on the functionality or recipients of the equipment streams it does cover. This leaves the ultimate destination and disposition of this equipment unknown, making it difficult to measure the effectiveness of Federal policies and demonstrate responsible management of taxpayer assets. It also consists of several different, sometimes duplicative and inconsistent reporting mechanisms. Improving electronics lifecycle tracking systems would provide the opportunity to manage the use and disposition of this equipment more efficiently and to encourage and facilitate environmentally sound use and disposition practices.

  GSA will issue revised property disposition reporting guidance to Federal agencies that streamlines all reporting mechanisms under the annual Report of Non-Federal Recipients. The new reporting system will gather data on the type, quantity, recipients, and intended use, including disposal as e-waste, of the electronics leaving Federal ownership, and be consistent with data gathered when the government purchases electronics, in order to track Federal electronics across their lifecycles more effectively.

  GSA will then develop tools which agencies can adapt their internal tracking systems, and propose revisions to the relevant sections of the Federal Management Regulation.

GSA will post data annually on Data.gov, beginning once the new Federal tracking system is in place.

The Federal Electronics Stewardship Working Group will recommend metrics and other reporting tools to measure agencies' progress in implementing the revised Federal Electronics Stewardship Policy to CEQ, including efforts to monitor Federal acquisition, operation, management, and disposal of electronics.

GSA will coordinate with EPA, CEQ, DoD, DOJ, and other agencies to determine the most cost-effective level of detail at which to track Federal electronics, and the appropriate exceptions to protect the security of equipment used for national security purposes by DoD, DHS, and other agencies.

- **More effectively direct Federal Government spending on electronics toward greener products through procurement changes.**

  The Federal Government currently directs its considerable spending on electronics toward greener products by requiring purchase of ENERGY STAR and EPEAT electronics whenever they are available. Some electronics not compliant with these programs are listed on procurement schedules; in many cases, these programs do not cover the products, in some they do. There are several changes that can be made to the way the government purchases electronics to improve implementation of these requirements.

  GSA will work, to the maximum extent practicable, to remove all products that are not ENERGY STAR or EPEAT, within product categories where ENERGY STAR qualified and EPEAT registered products are available, from the standing Government-wide information technology acquisition contracts it maintains for Federal agencies' use. GSA will implement this change as those contracts expire and are eligible for renewal.

  GSA will work with OMB to expand the use of green purchasing training by Federal employees involved in electronics purchasing, including procurement professionals, purchase card holders, information technology professionals, and other procurement request originators, so they are aware of the requirements and benefits of purchasing green electronics.

Since the DoD spends billions of dollars on procurement of electronics manufacturing, retail, rental, repair, and maintenance services annually,[26] its massive buying power can be leveraged to promote green electronics throughout the US defense industrial base. The DoD will promote green electronics as a source selection *preference* (for weapon system procurements), but not necessarily as a requirement due to performance requirements tied to national security needs. Defense prime contractors (e.g., weapon systems integrators) will levy these preferences on their suppliers, and green electronics promotion will ripple through the entire defense supply chain.

Finally, the Federal Government will work internally, as well as with the computer refurbishing industry to explore how best to make cost-effective refurbishment services available to Federal agencies to extend the useful life of non-functional equipment in Federal hands.

GSA will, as part of this effort, solicit input from industry and the public on whether providing refurbishment as a service to Federal agencies fits into viable business models for refurbishers, what appropriate standards and certifications ought to be considered, and how best to build Federal contracts for such services.

- **Expand the use of the intergovernmental cooperative agreements between the US Postal Service and other federal agencies to make it more convenient, efficient, and cost effective for government agencies with remote offices to directly ship used electronics to original equipment manufacturers, certified recyclers, or entities that will reuse the equipment.**

  The US Postal Service (USPS) has the Nation's largest network of package delivery and pickup services. Typically, its delivery vehicles empty as the carriers complete their routes, yielding an available, if unused, opportunity for picking up used electronics at low incremental transportation cost. USPS can help government agencies with remote offices lead by example by providing more convenient and cost effective methods to ship used electronics. The USPS Merchandise Return Service, and its Carrier Pick-Up enable government agencies to provide remote offices with prepaid postage and shipping supplies to directly ship electronics to original equipment manufacturers, to certified recyclers, and entities that will reuse the equipment.

[26] At least the $5.46 billion in Fiscal Year 2009 DoD contracts to firms in industries with North American Industry Classification System (NAICS) codes focusing on electronics. DoD Office of Small Business Programs, FY09 DoD Contract Obligations by NAICS Code, www.acq.osd.mil/osbp/doing_business/index.htm. Additional funds for subcontracts dealing with electronics were awarded by DoD contractors in other industries.

The USPS will work with other Federal agencies to establish intergovernmental Memoranda of Understanding (MOUs) to expand the use of USPS services (e.g., Merchandise Return Service, and Carrier Pick-Up) to provide government agencies, especially those with remote domestic offices, with more convenient and cost effective methods to directly mail or ship electronics to original equipment manufacturers, certified recyclers, or entities that will reuse the equipment.

Increase Safe and Effective Management and Handling of Used Electronics in the United States

American businesses, government, and individuals share the opportunity and responsibility in becoming better stewards of our global environment. The Federal Government recognizes its lead role in guiding and facilitating activities to achieve this shared goal. The Federal Government can engage communities, state, tribal and local governments, nonprofits, academia, and industry to increase recycling rates using certified recyclers, prevent discarded electronics from ending up in our landfills and expand our capacity to recycle used electronics for the betterment of our economy, health and environment.

There are a variety of players in the management of used electronics: collectors, who collect the electronics; brokers, who buy and sell used electronics, often via the Internet; refurbishers, who take computers no longer in use and refurbish them for reuse; and recyclers, who refurbish and dismantle the electronics, often into upgraded equipment or components. The number of collection programs and collection of used electronics has increased in recent years due mainly to the number of state take-back laws that have been enacted.

There is a range of tools to help ensure used electronics are recycled in an environmentally sound manner, including accredited third-party certification programs, best practices, and increased knowledge and transparency of the companies and practices along the recycling chain. Quality electronics recycling certification programs not only advance best management practices, but also offer a way to assess the environmental, worker health and safety, and security practices of entities handling used electronics. Currently, there are two voluntary systems certifying

electronics recyclers: R2[27] and e-Stewards.[28] The electronics recycling industry has been quick to embrace the new certification programs. As of the publication of this document, about 57 companies have had one or more of their facilities certified, representing about 100 different locations.

However, there is little information available on what happens to used electronics at the end of their useful life (i.e., reused, recycled, or disposed of as e-waste, and in what volumes). This type of information would be useful to determine the most effective approaches to collection, recycling and reuse. There is also opportunity to engage industry, NGOs, and other stakeholders to identify incentives for increasing responsible reuse and recycling by businesses, State, Tribal and local governments, and the general public. Although there is currently great capacity for managing used electronics in the US, there remain many opportunities to build upon these systems and improve the safe and effective handling of these materials throughout the process from collection to recycling.

The Task Force has identified the following approaches to achieving this broader goal:

- **Launch voluntary partnerships with the electronics industry to:**
  - **Increase collection of used electronics that is safely managed by certified recyclers.**
  - **Develop tools and materials that encourage the American public, businesses, states, and tribal nations to use certified recyclers.**
  - **Increase consumer awareness about the importance of electronics recycling, as well as the tools and services available to do so.**
  - **Involve States, tribal nations, NGOs and other stakeholders on the key elements of the voluntary initiative.**

EPA will seek the commitment of electronics industry companies that use electronics recycler certification programs and those who also go above and beyond those practices to increase their use of certified recyclers and provide data in a transparent manner.

In the short-term, EPA will work with these companies and other industry stakeholders to launch a voluntary partnership aimed at increasing the safe management of used electronics through the use of certified recyclers as a floor.

EPA will work with the electronic industry and other stakeholders to recognize best management practices for downstream management, encourage public disclosure, and promote tracking beyond third-party certification.

[27] R2, www.R2solutions.org; operated by R2 Solutions.

[28] E-Stewards, http://e-stewards.org/; operated by the Basel Action Network.

In the longer-term, this EPA initiative will strive for continuous improvement of the safe and effective handling of these materials throughout the system from collection to recycling to downstream facilities. This program will also educate consumers on the importance of reusing or recycling used electronics, and the methods and locations to do so.

- **Provide guidance to electronics recycling employers on providing facilities that offer safe and healthy working environments.**

  The Department of Labor's (DOL's) Occupational Safety and Health Administration (OSHA) provides compliance assistance,[29] including on-line and printed materials to help employers comply with, and workers understand, OSHA requirements and learn about OSHA's cooperative programs. One of the areas highlighted by these programs is on hazards in green jobs,[30] which DOL defines broadly as jobs that help to improve the environment, and which includes the work covered in this strategy. Designing work processes and equipment in a way that eliminates hazards to workers that will help ensure that green jobs in electronics recycling and related industries are safe jobs. DOL recognizes recycling as one of the important industries within the green job sector, has posted a webpage on Green Job Hazards: Waste Management and Recycling,[31] and has published Guidance for the Identification and Control of Safety and Health Hazards in Metal Scrap Recycling.[32] DOL especially encourages those industries that are beginning to grow, such as electronics recycling and related industries (e.g., remanufacturing, refurbishing), to use the concept of Prevention through Design (PtD),[33] that is, addressing occupational safety and health needs in the design process to prevent or minimize the work-related hazards and risks.

  DOL will develop and post material for its Green Job Hazards: Waste Management and Recycling webpage that addresses the electronics recycling and related industries.

  DOL will publish and post guidance for the identification and control of safety and health hazards in electronics recycling and related industries.

[29] OSHA Compliance Assistance, www.osha.gov/dcsp/compliance_assistance/index.html.
[30] OSHA Green Job Hazards, www.osha.gov/dep/greenjobs/index.html.
[31] OSHA Green Job Hazards: Waste Management and Recycling, www.osha.gov/dep/greenjobs/recycling.html.
[32] OSHA Guidance for the Identification and Control of Safety and Health Hazards in Metal Scrap Recycling, www.osha.gov/Publications/OSHA3348-metal-scrap-recycling.pdf.
[33] CDC Prevention through Design, www.cdc.gov/niosh/topics/PtD/.

- **Establish approaches to gather, track, and provide public access to information on quantities and movement of used electronics within the US.**

  As indicated above, the absence of a comprehensive tracking and reporting framework for electronic equipment makes the ultimate destination and disposition of this equipment unknown, making it difficult to measure the effectiveness of end-of-use and end-of-life practices. Improving electronics lifecycle tracking systems would provide the opportunity to manage the use and disposition of this equipment more efficiently and to encourage and facilitate environmentally sound use and disposition practices. Working with states, local jurisdictions, and other stakeholders that already have tracking and information systems in place will expedite and inform the development of improved tracking systems.

  EPA, in coordination with DOC, GSA, and other federal agencies will work to identify methods for domestic tracking of used electronics through a research agenda.

  EPA, in coordination with DOC, GSA, other federal agencies, universities and other entities, will determine if it can develop and publish an online tool so the public can access information on the quantities and flows of used electronics, and, if so, implement the tool.

Reduce Harm from US Exports of E-Waste and Improve Safe Handling of Used Electronics in Developing Countries

As American consumers continue to upgrade their computers, cell phones and TVs for the latest and most modern devices, a growing stream of e-waste from this turnover in products is producing unintended effects in the US and abroad. Used electronics in developing countries, which include exports from the US and other developed countries, combined with electronics discarded by their own consumers, are causing negative health and environmental effects. Though reliable and up-to-date information and data are scarce, a 2005 US industry report[34] stated that recyclers export 74% of their used electronics for reuse, refurbishing and recycling. EPA estimated that the US generated 2.4 million tons of e-waste in 2010,[35] comparable to the 2.3 million tons[36] that China produced that same year, according to a 2010 United Nations Environmental Programme

[34] International Association of Electronics Recyclers. IAER Electronics Recycling Industry Report. 2006 Update. www.iaer.org/communications/indreport.htm (report available at cost).
[35] EPA. Electronics Waste Management in the United States through 2009. EPA 530-R-11-002, May 2011. www.epa.gov/epawaste/conserve/materials/ecycling/docs/fullbaselinereport2011.pdf.
[36] UNEP. Recycling – From E-waste to Resources. 2010; www.unep.org/PDF/PressReleases/E-Waste_publication_screen_FINALVERSION-sml.pdf.

(UNEP) report, making the two countries the generators of the largest amounts of used electronics.

As one of the largest consumers of electronics in the world, the US has the responsibility to minimize the negative effects that discarded electronics have on health and the environment, in the US and abroad. The Task Force also recognizes that global markets play an important role in reuse, remanufacturing, and recycling of used electronics, creating environmental, economic, and social benefits, including bridging the digital divide by providing access to information technology products to many people in developing countries who would otherwise be unable to afford them. The proximity to markets where electronics are manufactured and where raw materials are available affects where recycling and other processing of used electronics takes place, as do available technologies, environmental standards, and labor rates. For example, there is high demand in Asia for used electronic components for remanufacturing electronics.

However, the Task Force has serious concerns about unsafe handling of used electronics, especially discarded electronics or e-waste, in developing countries, that results in harm to human health and the environment. For example, there are problems with open-air burning and acid baths being used to recover valuable materials from electronic components, which expose workers to harmful substances. There are also problems with toxic materials leaching into the environment due to improper disposal of e-waste in developing countries.

The following Federal agency efforts will complement the domestic efforts described in the preceding sections to improve US electronics stewardship in the international context:

- **Improve information on trade flows and handling of used electronics, and share data with Federal and international agencies, within the limits of Federal authorities.**

  Better understanding of the electronics lifecycle is critical to effective electronics stewardship. Used electronics are exported from the United States to both developed and developing countries. Countries' environmental, health and safety legal and regulatory regimes affect how used electronics are handled. There are significant differences in capacity to safely manage used electronics among facilities, and specific processes (e.g., refurbishment or remanufacturing versus recycling) may pose different levels of risk to the environment and health. A more comprehensive and detailed understanding of the "fates" of used electronics exports in this complex landscape will enable agencies to prioritize their actions on limiting specific activities that lead to harm to health and the environment (e.g., "backyard" operations, shipments to "sham" recyclers).

There is very little verifiable information about the trade flows of used electronics, including amounts exported or imported. Better data are needed to create a more comprehensive picture of the overall trade flows; countries could use such data to assist in managing their used electronics in accordance with their relevant domestic policies. Accurate information about the amounts, types of materials and destinations of used electronics exported will provide valuable information for the Federal Government, private industry, and other stakeholders. It is possible to improve the limited information currently available through Harmonized Tariff Schedule[37] and the Automated Export System[38] (see text box below) on trade flows of used electronics.

Harmonized Tariff Schedule

The Harmonized Tariff Schedule is a system of numerical codes that importers and exporters are legally required to use to classify their products prior to export or import. These HTS classification numbers are reported to US Customs & Border Protection (CBP) through the Automated Export System (AES) or, if the shipment is exempted from filing through the AES, are provided to CBP prior to export. The United States uses the HTS system as a foundation for determining both Schedule B numbers, which are used to generate export statistics, and the Harmonized Tariff Schedule of the United States (HTSUS), which is used in the import process. The HTSUS and Schedule B numbers capture categories of electronics, but do not distinguish between new or used products, nor do they have a single, separate category for electronics.

USTR will work with other federal agencies to explore ways to gather better, more detailed, trade data, including a study on US exports of used electronics to improve understanding of trade flows as well as provide information that could be used to help propose new Schedule B numbers to distinguish between new and used electronics in US export data.

EPA, DOC, USTR, and other relevant agencies will discuss ways in which to gather and share accurate data on used electronics exports. There are two ongoing projects that are already working to improve information on trade flows of used electronics from North America – one led by UN University's Solving the E-waste Problem (StEP) Initiative[39] and the other by the Commission for Environmental Cooperation of North America (CEC),[40] a trilateral partnership among the US, Canada and Mexico.

[37] Harmonized Tariff Schedule, http://hts.usitc.gov/; it is maintained by the United States International Trade Commission, an "independent, quasijudicial Federal agency" (www.usitc.gov/press_room/about_usitc.htm).
[38] Automated Export System, http://www.cbp.gov/xp/cgov/trade/automated/aes/.
[39] Solving the E-waste Problem, (StEP) Initiative, www.step-initiative.org.
[40] Commission for Environmental Cooperation of North America, www.cec.org.

EPA will work with other relevant agencies to develop an agreement for sharing export data on electronics across Federal agencies. This will help provide valuable information that EPA can use to enforce the rule that establishes conditions for the export of computer monitors and television sets containing cathode ray tubes (CRTs), which are often hazardous when disposed because of the presence of substantial amounts of lead.

EPA, DOC, and other relevant agencies will develop and implement a system for making information on used electronics flows available to the public.

- **Provide technical assistance and establish partnerships with developing countries to better manage used electronics.**

Many developing countries are confronting the dual challenge of managing the flow of used electronics exports from developed countries, as well as managing their own volumes of consumer-discarded electronics. The 2010 UNEP Report cited above predicts that by 2020, e-waste from old computers in South Africa and China will grow by 200 to 400% of 2007 levels, and in India by 500%.[41] As the US works to minimize the negative effects of used electronics at home and abroad and as other countries increasingly confront similar challenges in electronics stewardship, the United States has an opportunity to work with other countries to address the environmental and health impacts of unsafe handling of used electronics as a shared concern. The Federal Government can share best practices, and promote sharing by others, with developing nations on how to efficiently and effectively manage used electronics.

EPA and other relevant agencies will initiate a partnership with international organizations and others to share best practices for recycling with developing countries. Federal agencies will build on and enhance coordination among different bilateral and multilateral initiatives and organizations, including the Partnership for Action on Computing Equipment[42] (PACE), the Organisation for Economic Co-operation and Development[43] (OECD), the CEC,[44], implementation of EPA's bilateral agreements

[41] UNEP. Recycling – From E-waste to Resources. 2010; http://www.unep.org/PDF/PressReleases/E-Waste_publication_screen_FINALVERSION-sml.pdf, pp. 49-50.

[42] PACE, a multi-stakeholder public-private partnership established under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (www.basel.int), is a forum for governments, industry leaders, non-governmental organizations and academia to tackle the environmentally sound management, refurbishment, recycling and disposal of used and end-of-life computing equipment. www.basel.int/industry/compartnership/documents.html. PACE was established by Basel Convention Decision IX/9 (www.basel.int/meetings/cop/cop9/docs/39e-rep.pdf).

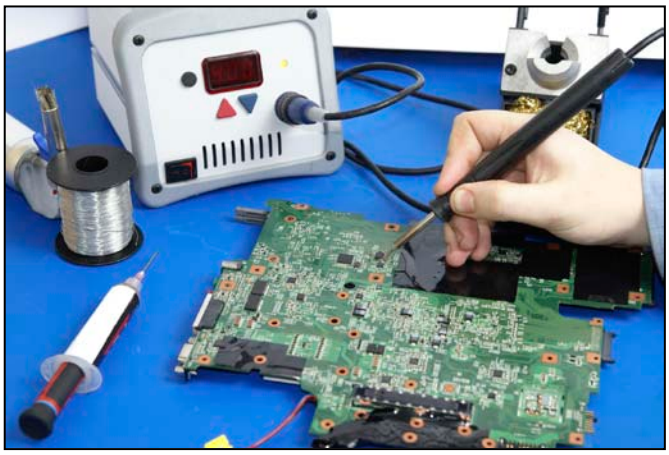
[43] The State Department describes (at http://usoecd.usmission.gov/mission/overview.html) the OECD (www.oecd.org) as a "forum where the governments of 34 democracies with market economies work with each other, as well as with more than 70 non-member economies to promote economic growth, prosperity, and sustainable development. [It] provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and coordinate domestic and international

with China and India, the US-China Joint Commission on Commerce and Trade[45] (JCCT) Environment Working Group, and the StEP Initiative.

USTR will pursue opportunities to discuss concerns about unsafe handling of used electronics in its bilateral and regional dialogues with countries (e.g., Trade and Investment Framework Agreements). Discussions could cover the industries and markets involved in trade in used electronics as well as trade flows; the environmental, economic, and social impacts of that trade; and possible ways to ensure transparency in markets and that traded used electronics will be managed safely.

- **Work with exporters to explore how to incentivize and promote the safe handling of remanufactured, recycled, and used electronics at home and abroad.**

Consistent with the President's Export Council and activities conducted under the National Export Initiative, the US will seek opportunities to promote environmentally sound exports of recycled and remanufactured electronics. The Federal Government will also explore how to incentivize and promote the safe handling of used electronics, especially e-waste, at home and abroad.



Agencies will engage with exporters to help ensure shipments of used electronics are handled safely abroad. Some companies are already taking a range and combination of steps, including certifying their facilities or sending used electronics only to recyclers that are certified; confirming that facilities receiving their shipments are properly licensed; requiring a verifiable environmental, health and safety management system at these facilities; limiting exports to items they believe pose less risk to the environment and health when handled abroad (e.g., functional devices); and exporting only to countries where they have confidence with respect to facilities' practices and the environmental, health and safety legal and regulatory regime (e.g., developed countries). The Task Force recognizes that there is no "silver bullet." It does believe that companies should seek transparency in their "supply" chains and take steps to avoid harm to the environment and health.

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policies."

[44] Commission for Environmental Cooperation of North America, www.cec.org.

[45] US-China Joint Commission on Commerce and Trade, www.commerce.gov/node/12467.

EPA, USTR and other Federal agencies will seek opportunities to share with exporters concerns and information about unsafe handling of used electronics exports abroad. They will engage with exporters on the importance of knowledge and transparency concerning the practices of such companies as exporters, brokers and recyclers, and environmental, health and safety legal and regulatory regimes downstream.

- **Propose regulatory changes to improve compliance with the existing regulation that governs the export of cathode ray tubes from used computer monitors and televisions that are destined for reuse and recycling.**

  The principal RCRA regulation affecting the export of used electronics from the US is the cathode ray tube (CRT) regulation, commonly known as the CRT Rule.[46] CRTs are the conical or pyramidal video display components of computer and television monitors. They are generally considered a hazardous waste under RCRA when disposed of because of the presence of substantial amounts of lead in their glass. In 2006, EPA modified its hazardous waste program to encourage recycling and reuse of CRTs. If CRTs are exported for recycling, the exporter must notify EPA and obtain consent from the receiving country before shipment. If CRTs are exported for reuse, the exporter must only provide a one-time notification to EPA with minimal information.

  Since the CRT rule was issued, the production of CRTs has decreased because they have been replaced by flat screen computers and televisions. Therefore, they are a diminishing fraction of the e-waste stream.[47] For this reason, many US glass furnaces that previously melted CRT glass to make new CRTs no longer accept this glass. Nevertheless, there are a substantial number of CRTs in storage,[48] many are still exported for recycling or reuse, and some CRTs that are exported for reuse continue to be disassembled and recycled under unsafe conditions.

  EPA will propose changes to the CRT Rule to better track exports of CRTs for reuse and recycling. The proposed regulatory changes would clarify who is subject to the rule, which may improve compliance throughout the regulated community. Additionally, EPA would gather more information on shipments of CRTs that are sent for reuse.

- **Support ratification of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.**

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[46] See 71 *Federal Register* 42927-42949, July 28, 2006; and www.epa.gov/osw/hazard/recycling/electron/.

[47] EPA, Electronic Waste Management in the United States through 2009. EPA 530-R-11-002. May 2011. www.epa.gov/epawaste/conserve/materials/ecycling/docs/fullbaselinereport2011.pdf. Figures 4 and 5.

[48] EPA, Electronic Waste Management in the United States through 2009. EPA 530-R-11-002. May 2011. www.epa.gov/epawaste/conserve/materials/ecycling/docs/fullbaselinereport2011.pdf. Figure 6, Table 14.

In 1990, the US signed the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention[49]), which is an agreement among countries to control imports and exports of hazardous wastes. The Senate provided its advice and consent for ratification, but implementing legislation has not been passed.

The Partnership for Action on Computing Equipment[50] (PACE) is developing guidance on the environmentally sound management of used and end-of-life computing equipment with an emphasis on reuse and recycling.

There are ongoing discussions about whether and how used electronics generally fall within the scope of the Basel Convention. Ratification of the Basel Convention would enable the US Federal Government to fully participate as a Party (instead of an observer) in how the Convention is applied to used electronics and e-waste and promotes their safe handling. Ratification would also provide the US with a stronger voice in the PACE workgroup.

The Department of State and EPA will work together to explore options for strengthening US participation in the Basel Convention, including options that would enable ratification.

[49] Basel Convention, www.basel.int/text/17Jun2010-conv-e.pdf.
[50] PACE, www.basel.int/industry/compartnership/documents.html.

CONCLUSION

The National Strategy for Electronic Stewardship identifies steps America will take together to handle our electronics resources more sustainably from the moment American technology pioneers dream of them to the time we entrust them for collection, reuse, recycling and disposal. The recommendations outlined here span the entire Federal Government, draw on the ingenuity of its employees and programs, provide opportunities for the private sector to create green jobs, and coordinate the Government's leadership role in making electronics procurement and disposition choices beneficial for public health, the environment, and the economy. Reflecting the valuable input from public comments and stakeholder meetings, the strategy also sets in motion a continuing dialogue on how best to craft the individual recommendations and actions necessary to seizing the opportunity presented by used electronics.

This strategy carries out the intentions of President Obama to address the challenge of protecting human health and the environment from potentially harmful effects of the improper handling and disposal of these products. In doing so, it represents consistent and comprehensive steps forward that will engage government, industry, non-profit, and international partners and will call on every American to recognize the value of the electronic products integral to our lives and to handle them safely and responsibly.

ABBREVIATIONS

CBP	Customs and Border Protection, within DHS
CEC	Commission for Environmental Cooperation of North America
CEQ	White House Council on Environmental Quality
CRT	Cathode ray tube
DHS	Department of Homeland Security
DOC	Department of Commerce
DoD	Department of Defense
DOE	Department of Energy
DOL	Department of Labor
EO	Executive Order
EPA	Environmental Protection Agency
EPEAT	Electronic Product Environmental Assessment Tool
FCC	Federal Communications Commission
FEMP	Federal Energy Management Program
GSA	General Services Administration
HTS	Harmonized Tariff Schedule
OECD	Organisation of Economic Cooperation and Development
OMB	Office of Management and Budget
OSHA	Occupational Safety and Health Administration, within DOL
OSTP	Office of Science and Technology Policy
PACE	Partnership for Action on Computing Equipment
R2	Responsible Recycling Practices for Use in Accredited Certification Programs for Electronics Recyclers, one of the industry's practice standards; e-Stewards is the other industry practice standard
RCRA	Resource Conservation and Recovery Act
UN	United Nations
UNEP	UN Environmental Programme
US	United States of America
USPS	US Postal Service