Lifecycle Management of Electronics from Procurement to Disposal

DESCRIPTION
Electronics manufacturing and disposal contributes to serious global environmental and health concerns. When procuring electronics, use global standards to help optimize considerations that minimize impacts of operations and disposal.

PROJECT TALKING POINTS

Electronics, Production, Waste and Impacts

• Because electronics are produced and recycled globally; because they contain toxic and environmentally harmful materials, and they are highly resource-intensive products; reductions in impact through better product selection and management can have positive results for human health and the environment around the world.

• It is estimated by the United Nations University’s Solving the E-Waste Problem (StEP) Initiative that global e-waste volumes could increase by as much as 33 percent between the years 2013 and 2017.

• The U.S. generates more total e-waste per year - 9.4 million tons – than any other country. (UN University’s Solving the E-waste Problem)

• US EPA estimated that in 2013, the consumer electronics recycling rate in the US rose to 40%, up from 30% in 2012.

• Discarded electronics pose waste and liability concerns. Proper disposal is a regulatory issue mandated in the US by state and federal Environmental Protection Agencies. Many large organizations still fail to comply with the regulations designed to protect the environmental and human health from e-waste impacts.

• Despite landfill bans and e-waste collections programs across the country, some 40% of heavy metals in US landfills are estimated to come from discarded electronics.

• The U.S. EPA’s ENERGY STAR estimates that if all computers sold in the U.S. met ENERGY STAR requirements, end users’ energy cost savings could reach more than $1 billion each year.

• Mining and manufacturing of more than 40 elements used in the production of electronic devices consume substantial amounts of energy and water, and results in toxic byproducts and emissions.
• Even in the most technologically advanced electronics recycling systems, the majority of resources extracted and processed are simply lost.

• It takes approximately 2,200 gallons of water, including 1,500 gallons of ultra-pure water, to create one integrated circuit on a 30-centimeter wafer – and one computer can contain a multitude of those little wafers, or chips.

• Electronic components come from minerals and materials from around the globe. Global Reporting Initiative (GRI) standards include the identification of hot spots in order to avoid when possible. E.g., in areas of the world where general lawlessness and potential human rights abuses occur, one might consider sourcing from other parts of the world. That’s the benefits of purchasing power that supports economies and practices that are positive for the health of humans and the environment.

• Global e-waste recycling practices, and abuses, are well documented. Only 29% of global e-wastes are estimated to utilize formal (i.e., accepted best practice) recycling channels. The other 71% flows into unregulated, uncontrolled practices where nearly all of the products’ components and materials are discarded, and moreover, workers who handle these materials are exposed to toxic and potentially damaging substances like mercury, dioxin, and heavy metals. These components are often then released to the environment resulting in local and global harm. (source, source)

Electronics and Healthcare Organizations

• Rapid expansion of healthcare-related computing, and networking and storage demands for electronic record keeping drives potentially significant increases in procurement costs, energy and waste-related impacts and will drive expenses. For example, massive data storage operations, both onsite and in offsite data centers can require high energy consumption and may have marked greenhouse gas impacts.

Electronics Lifecycle Management

• Using a Total Cost of Ownership approach including end of life management operational impacts and costs can help establish a comprehensive cost of procuring “safer” electronics, owning, operating, and disposing (recycling) of electronic devices throughout their lifecycle.

• In brief, it is critical to
  ◆ right-size purchase (including consideration of cloud based solutions and leasing), meaning, purchase only what you need, with careful consideration to not under- or over-sizing computational power;
  ◆ aggressively manage devices in use (e.g. for energy consumption, associated paper use policies, ink/toner use reduction);
  ◆ focus on extending the product lifecycle through upgrades, refurbishment, and redeployment of equipment that has been decommissioned by one department but can meet needs elsewhere; and
  ◆ deliver assets your organization can no longer use to responsible resale, donation or recycling.
Triple Bottom Line Benefits

$ Cost savings – Energy-efficient electronics – computers, monitors, printers, copiers, televisions - are widely available and competitively priced. By using these products, hospitals can realize significant cost savings from the energy saved in contrast to less efficient equipment. ENERGY STAR estimates that if all computers sold in the U.S. met ENERGY STAR requirements, end users’ energy cost savings could reach $1.8 billion each year. By maintaining devices in use over a longer time period – extending refresh cycles for equipment, upgrading existing devices, redeploying older machines within the organization- hospitals can also cut technology purchasing costs. And finally, extracting revenue at end of life from responsible recycling of usable parts, resale or donation of equipment can reduce overall e-waste management costs.

🍃🍃 Environmental benefits – Electronics that are designed for reduced toxicity, easier upgrades and effective recycling (such as those that qualify for EPEAT® registration) can reduce extraction and consumption of natural resources, hazardous materials use and wastes, emissions to air and water and greenhouse gas releases. Purchasing electronics that are designed and produced in ways that reduce lifecycle impacts and increase ease of recycling, managing them effectively in use, extending their useful life and disposing of them through responsible end of life systems all reduce the negative environmental impact of hospitals’ ICT operations.

The Electronics Environmental Benefits Calculator developed by EPA allows EPEAT purchasers to estimate the environmental benefits – reductions in greenhouse gas, solid waste, hazardous waste, toxic substances – related to purchasing products that meet the EPEAT criteria.

🌿 Health and safety benefits – Some toxins contained in electronics – such as mercury -- can travel and impact global health far from their release. Others like lead and dioxins, can devastate the health of local communities and workers when equipment is handled through informal recycling. We all benefit from cleaner air, soil, and water. Customers and staff also benefit indirectly from the cost savings these purchases enable, which allow more dollars to be invested in patient welfare, staff safety and satisfaction.

Purchasing Considerations

Because implementation of purchasing issues is core to this PIM, we’ve included the step-by-step implementation guidance in the How-To section.

Below however, is an overview of EPEAT® as a foundational purchasing requirement, where applicable, in the PC/display, imaging equipment (copiers, printers), and television products categories. EPEAT is a comprehensive environmental rating that helps identify greener electronics. More than 55 manufacturers participate, with over 2500 products registered - so product choice is not restricted by an EPEAT requirement.

EPEAT ranks equipment as Bronze/Silver/Gold based on 50+ criteria in each product category that address all phases of the product life cycle, including reduction of toxics, recycled and/or bio-based content, energy efficiency (ENERGY STAR is required), design for recycling, design for extended useful life, company performance and availability of manufacturer collection and recycling programs.
The [EPEAT website](https://www.epeat.net) provides a public database of all registered products, searchable by manufacturer, product model, and environmental attributes. The website also provides numerous purchaser resources - including [model policy and contract language](https://www.epeat.net) for all existing categories, [lists of purchasers using EPEAT](https://www.epeat.net) with contract information, and [case studies](https://www.epeat.net).

Practice Greenhealth’s FREE [Healthier Hospitals program](https://www.practicergreenhealth.org), where any hospital in the US and Canada can enroll and take on one or up to six challenge areas – including Smarter Purchasing – is a way for healthcare organizations to join the shift to a more sustainable business model while addressing the health and environmental impacts of the healthcare industry. Enrollees can commit to the procurement of EPEAT-registered computers, copiers, printers and televisions, as outlined above and access free resources, guidance and case studies. The value of enrollment is the capture of data, which is used in the aggregate to drive change in the supply chain and help hospitals come together around important environmental purchasing issues.

In the 2015 compilation of [case studies](https://www.practicergreenhealth.org) entitled, “Advancing Sustainability in Health Care”, on page 51, Kaiser Permanente, shares their 2014 purchasing success with EPEAT. They purchased 100% EPEAT-registered electronics, resulting in $5 million annual energy cost savings, without increasing procurement costs. The [2014 Milestone Report](https://www.practicergreenhealth.org) shares outcomes and highlights from each of the six Healthier Hospitals challenge areas.

**HOW-TO**

1. **Understand Current Systems**

   *Map the current flow of electronics into and out of your facility or system. Form a team with the information Technology (IT) department, procurement staff and Facilities/Waste Management to understand responsibilities and policies already in place. For example:*

   a. List who is primarily responsible for product selection across all product categories. Is it IT, with Procurement playing a supporting role? Procurement, in consultation with IT? (Note: the next step includes developing a list of responsible and accountable staff for a variety of operations included in the overall management of electronics in your facility. The important step though, is a thorough stakeholder outreach process for all categories of devices, as stakeholders in different product categories are likely to be different people (e.g., computers, printer, TVs)).

   b. Understand how electronic purchases are specified today. Is it at a system level or facility-by-facility level? Note that the important element here is understanding what sets of standards or guidelines are used today, if any.

   c. Is ENERGY STAR used as a decision-criteria for purchasing? In which product categories, and how?
d. Is EPEAT used as a decision-criteria? Note that EPEAT-registered devices take into account both energy savings and other environmental benefits, so using EPEAT takes into account all ENERGY STAR ratings.

e. Do you lease or purchase IT and office electronics? Note that it is important to include program goals in all service contracts.

f. What services, related to sustainable electronics management, do contracted providers provide?

g. Does your procurement happen on a set ‘refresh cycle’ basis? If so, what is the interval? If not, what factors determine the timing of new purchasing?

h. What processes are in place to extend the useful life of the equipment by redeploying it within the facility or system and to recover some value at end of life through donation or resale of devices or components?

i. What are the waste costs and operational processes connected with your discarded electronics?

j. Are waste management and compliance (e.g. RCRA or other liability) concerns factored into the life cycle procurement process? (i.e. does the ‘back door’ team such as waste management /safety officer provide guidance on their needs to the ‘front door’ procurement staff?)

k. What due diligence has been performed on end of life management and downstream processors to make sure the materials are handled responsibly?

2. DEVELOP KEY PERFORMANCE INDICATORS (KPIs) AND A LIST OF RESPONSIBLE PARTIES TO ENSURE COMPLIANCE

Identify responsible staff; measure and track your program’s progress to ensure program compliance. For example:

a. Develop list of key program goals and related Key Performance Indicators (KPI) that can track performance against the goals, e.g.:

   ◊ Use EPEAT registered products whenever possible. Data point = EPEAT Reporting from vendors.
   ◊ Implement programs to extend the life of all relevant electronic devices. Data point(s) = maintenance and refurbishment data.
   ◊ Implement a continuous employee education program to maximize the value of the electronic management program goals. Data point(s) = test staff knowledge during, for example, Environment of Care rounds.
   ◊ Recycle to the greatest extent possible, all electronic devices, using a certified recycler, or contact the manufacturer about their EPEAT-required take-back and recycling program. Data point(s) = recycling and waste data

   • E-Stewards Certified Recyclers
   • R2 Certified Recyclers
b. A “responsible party” checklist will include users from specific departments that have primary responsibility for specific items in the electronics management program. E.g.,

◊ Strategic Sourcing: implementation of the checklist, inclusion of the right contract language, contract compliance

◊ Procurement: work with vendors and finance department to execute purchase orders

◊ IT: support for major systems like EMRs or HR, likely the user’s help desk contact; refurbishment and repurposing coordination, etc.

◊ Sustainability Coordinator: training and education to users; overall coordination

◊ Safety Officer or designated Hazardous Materials Officer: all compliance related responsibilities

◊ User group representatives: responsibility for ensuring processes are easy for users.

Summary of Links: Performance Indicators

- Electronics Management Policy and Procedures Checklist
- Model Purchasing Policy Language
- Disposal considerations
- ENERGY STAR Low Carbon IT Power Management Pledge

3. STRATEGIC SOURCING -- ADDRESS CRITERIA IN NEW PROCUREMENT

Work with IT, Procurement, Facilities and your vendor or solution provider to address environmental concerns in new procurement:

a. Identify your goals and targets specifically for purchasing (more detailed than overall program goals).

b. Require EPEAT® registration for new procurement of all covered products. These include PC products (desktops, laptops, monitors, thin clients, workstations, and tablets), televisions, and imaging equipment (printers, copiers, fax machines, scanners, digital duplicators, mailing machines). Work with your vendor/GPO on this contract requirement.

◊ Encourage your IT department leads to visit the EPEAT website and review the product and vendor options to be found there, in order to familiarize them with the extensive product choices. This may reduce any pushback as you move to purchase registered, environmentally preferable products.
c. In addition to EPEAT, other evaluation criteria considerations:
   ◊ Include ability of vendors to perform End-of-Life (EOL) management services.
   ◊ Include at least 3 identified environmental attributes in purchasing specifications (fulfilled by purchasing EPEAT® products).
   ◊ Include ability of vendors to provide reduced packaging. EPEAT® products might fulfill this requirement. Check with vendor or EPEAT® registry.
   ◊ Include total cost of ownership (see item 3.d.).
   ◊ Include ability of vendors to provide training about environmental aspects of their products to users.
   ◊ Include products’ design for recyclability. EPEAT® products might fulfill this requirement. Check with vendor or EPEAT® registry.

d. Include contract requirement clauses requiring the following, (and provide oversight of contract to ensure vendor compliance with these clauses)
   ◊ ENERGY STAR® qualified products for all product categories outside the scope of EPEAT
   ◊ Product manuals to be delivered on compact disc (CD) or made available online, in lieu of paper copies of manuals.
   ◊ Delivery of products in “multi-packs” (i.e., multiple items in one box).
   ◊ Vendors to take-back all packaging, or choose EPEAT-registered products that meet optional criteria for packaging take back.
   ◊ Vendors to take-back products at end-of-life, or utilize vendor’s take back service for EPEAT-registered products.
   ◊ Regular reports on contract compliance

e. Establish policy and contract requirements for those areas where EPEAT standards are under development, to encourage manufacturers to be moving in a positive direction. Standards are currently underway for Servers and Mobile Phones

f. Use Total Cost of Ownership, or TCO, as a tool for systematic consideration of all costs related to an information technology (IT) management decision. TCO includes all costs, direct and indirect, incurred throughout the lifecycle of an asset, including acquisition and procurement, operation and maintenance and end-of-life management. The U.S. EPA developed the following resources for federal and state governmental organizations but it works well for any organization:
   ◊ Total Cost of Ownership Guidance – an overview of TCO modeling and guidance on how to utilize TCO to make purchasing decisions for information technology products.
   ◊ Total Cost of Ownership Calculator – allows users to compare the costs of different options specially designed for the lifecycle management of IT equipment with an emphasis on decisions that may have an environmental impact.
g. Get the recognition you deserve:

◊ Become an EPEAT Purchaser
◊ Enroll in the Healthier Hospitals Smarter Purchasing Challenge

Summary of Links: Strategic Sourcing
- EPEAT Registry by Device Category
- Sample Model Policy and Contract Language
- Environmental Benefits Calculator
- EPEAT Environmental Criteria for Each Product Category
- Total Cost of Ownership Calculator
- Electronics Management Policy and Procedures Checklist
- Model Purchasing Policy Language
- ENERGY STAR Low Carbon IT Power Management Pledge

4. Assess Criteria for Leased Equipment
   a. If equipment is leased, assess the possibility of extending current lease, upgrading existing equipment vs. purchasing or leasing of new equipment.
   b. Require leasing agent provide your organization with EPEAT-registered products.
   c. Require leasing agent to report on how products are handled at end-of-life.

5. Optimize Operations -- Extend the Lifecycle of Existing Equipment and/or Future Purchases
   a. Work with IT, Procurement and Facilities (and your IT Solution Provider if you have one) to assess your current electronics asset base and planned replacement schedule.
   b. Investigate what factors determine the refresh cycle – is it perceived inability to update software? Depreciation cycles? Vendor pressure for the newest technology?
   c. Address reliability measures in your procurement, with refurbishment or replacement required within a given time frame for any failed equipment.
      ◊ EPEAT Product longevity/life-cycle extension criteria call for products to be upgradeable, under warranty, and for the manufacturer to have available information about spare parts and provide a process to address early product failure.
   d. Decide which products could be maintained for a longer time period than the standard cycle – with or without upgrades to hardware and/or software – with minimal or no impact on operations.
   e. Consider which items can be redeployed from high performance settings for reuse in less critical functions – and which settings’ non-critical usage enables deployment of older equipment.
f. Consider using approaches like the thin client model, where software updates and system changes are carried out on a central server, enabling longer useful life for terminals.

g. **Extending the Life of Electronic Equipment.** The EPA’s Federal Electronics Challenge created a comprehensive guide designed to help extend the life of your IT equipment.

h. **Improve Operation and Maintenance of Electronic Equipment.** The EPA’s Federal Electronics Challenge created a comprehensive document that includes maximizing energy conservation and efficiency features, efficient acquisition and use of copiers/printers.

---

**Summary of Links: Operations and Utilization**

- [Extending the Life of Electronic Equipment](#)
- [Improve Operation and Maintenance of Electronic Equipment](#)
- [ENERGY STAR Low Carbon IT Power Management Pledge](#)

---

6. **DEVELOP END OF LIFE (EOL) MANAGEMENT SYSTEMS**

   By now, your management program should reflect a hierarchy of best practices. After strategically purchasing the “best” devices and optimizing the utilization in order to refurbish and reuse in-house, you reach the point where devices are no longer useable in your organization. Next steps include:

a. Understand all Federal, state and local regulations, including but not limited to [RCRA](#) & [HIPAA](#). Be sure to check for your [state’s e-waste laws](#).

b. Erase data and sanitize equipment. Track devices in asset management system. (If using an outside vendor, they may provide this service as part of your contract.)

c. Donate usable equipment to a reputable reuse organization.

d. If you have arranged end of life services from your hardware vendor as part of your purchase contract, take advantage of those services now, at the cost and with the conditions negotiated at time of purchase. (See step 3d above).
e. Establish a service contract with a third party asset disposition vendor (or your manufacturer vendor’s take-back division) that supports the full spectrum of end of life activities – redeployment, refurbishment and reuse, sale and donation, harvesting of saleable parts, and recycling.

◊ E-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment® (e-Stewards), and Sustainable Electronics Recycling International (SERI)/R2 set standards and provide certificates to electronics recyclers globally.

◊ EPEAT requires that all registered products have manufacturer takeback and recycling that meet specific best practices, and approves standards that qualify, including R2 and eStewards.

◊ Sustainable Electronics Recycling International sets standards and provides certificates to electronics recyclers for the R2 standard.

f. Require asset tracking and reporting* by all Asset Disposition and recycling service vendors to ensure management through certified recyclers, and confirmation of appropriate final disposition of all discarded electronics.

g. Understand the issues around electronics recycling. Improper disposal is a serious health and environmental concern. Released in 2015, the NIH (National Institute of Environmental Health Sciences) provides a comprehensive report on E-Waste and Harm to Vulnerable Populations: A Growing Global Problem.

h. Consider disposal attributes (key performance indicators), that are important to track during the contracting and ongoing management program. Attributes will help identify the success or concerns about the program, so that corrections can be implemented.

i. Educate staff about all electronics recycling.

Summary of Links: End-of-Life

• Disposal considerations from the Electronics Take-Back Coalition
• National Center for Electronics Recycling
• e-Stewards Certified Recyclers
• SERI R2 Certified Recyclers

7. MANAGE, EDUCATE, TRACK, AND ADJUST

Manage new systems through compilation and organization of all of the above steps. Track your performance indicators and report regularly. Adjust your program accordingly.

a. Establish a system for all of the above information, assign responsibilities to team members, and track progress.

b. Ensure policies incorporate both your goals and procedures. Ensure the responsible party is identified for each major step to ensure compliance with all policies.

c. Launch an educational program* to promote these policies and ensure all users can access the support they need to do the right thing.
d. Remember to include all opportunities for all users to participate in recycling activities that include computers, cell phones, toner cartridges.

**Summary of Links: Tracking**
- ENERGY STAR Low Carbon IT Power Management Pledge
- Power Down Customizable Poster by FEC
- Double-Sided Customizable Poster by FEC
- Recycle Toner Cartridges Customizable Poster by FEC

8. **Policies and Procedures**

*Develop standardized guidance for the purchase, use, and end of life disposition of electronics:*

a. Develop explicit environmental guidelines for greening electronics procurement – e.g. require EPEAT or ENERGY STAR registered products.

b. If practical, implement through the IT department a policy encouraging standardization on a limited number of models to simplify specifying, purchasing, redeploying, and upgrading equipment.

c. If departments or individuals can order their own electronic products, develop a central portal through which these orders are placed to track purchases and compliance with policies. Check with your vendors whether they are able to block access to non-EPEAT, non-Energy Star products.

d. Develop policies and practices encouraging reduction in resource consumption during use phase – e.g. extending product life, requiring ENERGY STAR implementation, power management, duplex printing and copying, extended toner use, toner cartridge recycling.

e. Implement policies and detailed procedures for equipment at end of life to clearly inform end users whom they should contact when they wish to dispose of an electronic device. Ensure the policy provisions support the hierarchy of reuse -- redeployment, refurbishment, donation, or resale – wherever possible, and responsible recycling where reuse strategies will no longer work.

f. A policy and procedure checklist which includes who is responsible for keeping it updated, and training staff on implementation.

**Summary of Links: Policies and Procedures**
- Organizational Purchasing Policy for Electronics
- Electronics Procurement Management Checklist
- Sample Power Management Policy
- Printer/Copier Automatic Duplexing Guide
- Extended Toner Use Guide
- End-of-Life Considerations
- Annual EPEAT Purchasing Volume Report
9. **Report and Share Your Success**

a. Promote your organization’s efforts through internal informational resources and externally through media outlets, client newsletters, and awards programs.

b. Healthier Hospitals Smarter Purchasing – Greener Electronics Challenge requires data submission on dollars spent on EPEAT-registered products to report out on health care’s focus on healthier procurement of products, supplies and services. Work with the over 1,000 hospitals that have committed to the Healthier Hospitals program and share your success and challenges with others in the sector so that ultimately we can achieve more together. Learn more and enroll at [www.healthierhospitals.org](http://www.healthierhospitals.org).

c. Develop a regular reporting mechanism to leadership to substantiate corporate responsibility and compliance targets. For example,

   ◊ An annual confirmation that electronics purchased and recycled have met the stated guidelines
   ◊ Evidence that operational guidelines (e.g., double side paper copying policies, toner recycling data; energy savings from maximizing energy saving strategies, etc.) have been met, with some data on impacts

d. **Become an EPEAT Purchaser** to gain recognition by the Green Electronics Council and to qualify for recognition and awards programs.

---

**Summary of Links: Reporting Tools**

- Environmental Benefits Calculator
- EPEAT Purchasing Report
- Sample Vendor Contract Language Requiring EPEAT
- Model Purchasing Policy Language

---

**CASE STUDIES**

- **Purchasing Environmentally Responsible Electronics with EPEAT: The First Decade** Understand the 10-year impact of having an environmentally preferable purchasing policy for electronics in this case study from Kaiser Permanente.

- Healthier Hospitals’ **Advancing Sustainability in Health Care** Compilation of Case Studies, highlights case studies on environmental improvement activities in a wide range of areas, including through the Purchase of EPEAT-registered computers – See Page 51 for Kaiser Permanente Success with EPEAT.
The U.S. Federal government follows stringent responsible procurement and recycling guidelines, including a recent update to the Federal Acquisition Regulations (FAR) instructing all Federal agencies “to procure EPEAT-registered products” in three device categories: PCs and Displays, Televisions, and Imaging Equipment (printers, copiers, scanners, multifunction devices, fax machines and mailing machines). Additional information about the U.S. Federal government’s EPEAT policies is available at [www.epa.gov/epeat](http://www.epa.gov/epeat). Multiple bills to address e-waste recycling and ban export of hazardous e-waste to developing nations have been filed in the House and Senate, but none have passed.

While there is currently no Federal mandate to recycle e-waste, twenty-five US states have e-waste programs in place that ban delivery of e-waste into solid waste systems, and govern manufacturer take-back or other options for safely disposing of outdated electronics. The National Center for Electronics Recycling outlines each state’s status and program details. Be sure to contact your state’s solid and hazardous waste programs (or dedicated e-Waste program) to make sure you are up to date on the rapidly changing requirements.

Besides the EPEAT and ENERGY STAR procurement standards, look for certified recyclers who have met best practice requirements of the R2 or e-Stewards certification programs, which provide assurance that the certified recycling facility or organization is following best practices with regard to worker safety and health.

**Cross References: Leadership in Energy & Environmental Design (LEED)**

LEED 2009 for Existing Buildings: Operations & Maintenance


b. Materials and Resources, Credit 8, Solid Waste Management – Durable Goods, 1 Point.

**Performance Improvement Measures Synergies**

- [Adopt a facility-wide environmentally preferable purchasing (EPP) policy.](#)
- [Computers and monitors](#)
- [ENERGY STAR office equipment](#)
- [Audit all hazardous waste-related activities to ensure compliance with all local, state, and federal regulations.](#)
- [Total Cost of Ownership and Adopting a “Cost Quality Outcomes” approach to procurement.](#)
Contact Us

If you have information or tools to share (e.g., suggestions for purchasing considerations, suggested sample contract language for any product or contracted service, policies or procedures, fliers, or educational materials, please let us know.

- Laura Faye, LFaye@mazzetti.com
- Sarah O’Brien, Sarah.Obrien@GreenElectronicsCouncil.org
- Andrea Desimone, Andrea.Desimone@GreenElectronicsCouncil.org