

Environmental Benefits of 2007 EPEAT Purchasing

*Green IT Procurement System's Success
Drives Major Environmental Benefits*



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EXECUTIVE SUMMARY

Information technology has enabled significant improvements in the standard of living of much of the developed world, and through its contributions to greater transport efficiency, improved design, reduced materials consumption and other shifts in current practices, may offer a key to long term sustainability. However, the production, purchase, use and disposal of electronic products such as personal computers and monitors also can have significant negative environmental impacts.

The EPEAT (Electronic Product Environmental Assessment Tool) system for greener electronics purchasing addresses many of these issues. This is the second annual report by the Green Electronics Council (GEC), which manages the EPEAT system, on the environmental benefits resulting from the purchase of electronic products registered and evaluated under the EPEAT program.

The EPEAT System

The Electronic Product Environmental Assessment Tool (EPEAT) program was launched in 2006 to help purchasers identify environmentally preferable electronic products – starting with a product standard and registry addressing personal computers and monitors.

The EPEAT environmental performance criteria and registry system were developed through a multi-year, multi-stakeholder process supported by US EPA that included participants from the public and private purchasing sectors, manufacturers, environmental advocates, recyclers, technology researchers and other interested parties.¹

The development of EPEAT was prompted by a growing demand for an easy-to-use evaluation tool that enables the comparison and selection of electronic products based on environmental performance attributes. IT purchasers needed a simple way to assess products' environmental impacts, and electronics manufacturers in turn wanted consistent guidance to ensure their green design efforts met with success in the marketplace.

EPEAT meets both constituencies' needs with a user-friendly system designed and guided by all stakeholders that is accessible to purchasers and manufacturers of any size. As a result, EPEAT has revolutionized the electronic product sector, with significant manufacturer and purchaser participation and an extensive registry of hundreds of electronic products that meet the system's demanding criteria.

The EPEAT system – 51 environmental performance criteria, a registry where products meeting those criteria are listed, and a verification system for vetting product declarations – offers purchasers an easy to use environmental screen for products based on a wide array of lifecycle impacts.

¹ For a detailed overview of EPEAT's development, see http://www.zerowaste.org/peat/peat_development.htm

The system also provides manufacturers with guidelines for development of environmentally preferable products that will meet market demand. And it establishes competition among manufacturers to meet higher rating levels, which pushes innovation and environmental excellence forward.

Launched only 18 months ago, EPEAT has so effectively met the purchasing community's need for a tool to measure environmental performance in IT hardware that purchasers are adopting the tool in larger numbers every day. (See www.epeat.net/RFP.aspx for a sampling of purchasers using EPEAT.)

Through increasing purchase of EPEAT registered products, participating manufacturers are being directly rewarded for their environmental design and service efforts. And with more than 580 products currently registered by more than 25 manufacturers, EPEAT has grown to be the most comprehensive and effective environmental purchasing tool available for IT hardware. The rapid expansion of the EPEAT system is a clear indication of its value in the world of environmentally preferable purchasing.

Environmental Benefits of 2007 EPEAT Purchases

To enable purchasers to measure the benefits of their EPEAT purchasing vs. purchase of conventional products, US EPA supported the development of a lifecycle environmental benefits calculator by the University of Tennessee Center for Clean Products and Clean Technologies. The calculator assesses environmental benefits from electronic product purchases based on specific EPEAT criteria and tiers. By entering information provided by EPEAT's subscribing manufacturers on unit sales of registered products, it is possible to estimate the environmental benefits of overall EPEAT purchasing year by year.²

² As discussed in the body of this report, EPEAT is not the sole motivator of the environmental benefits reported here—in addition to some unique criteria of its own, the EPEAT system brings together into one unified tool such critically important criteria as ENERGY STAR and RoHS compliance, and attributes required under other major environmental evaluation programs.

Sales of EPEAT-registered products worldwide in 2007 totaled more than 109 million individual units. Growth of EPEAT products' market share has been rapid – EPEAT registered desktop and laptop sales constituted more than 22 percent of total worldwide units shipped in 2007. The lifecycle environmental benefit of those sales, compared to the purchase of conventional products is huge.

2007 purchases of EPEAT registered laptops, desktops, and monitors over conventional products will:

- Reduce use of primary materials by 75.5 million metric tons, equivalent to the weight of more than 585 million refrigerators
- Reduce use of toxic materials, including mercury, by 3,220 metric tons, equivalent to the weight of 1.6 million bricks
- Eliminate use of enough mercury to fill 482,381 household fever thermometers
- Avoid the disposal of 124,000 metric tons of hazardous waste, equivalent to the weight of 62 million bricks.

In addition, due to EPEAT's requirement that registered products meet ENERGY STAR's energy efficiency specifications, these products will consume less energy throughout their useful life, resulting in:

- Savings of 42.2 billion kWh of electricity – enough to power 3.7 million U.S. homes for a year
- Elimination of the release of 174 million metric tons of air emissions (including greenhouse gas emissions) and almost 365 thousand metric tons of water pollutant emissions
- Reduction of 3.31 million metric tons of carbon equivalent (MTCE) greenhouse gas emission – equivalent to removing over 2.6 million U.S. cars from the road for a year.

Remarkably, these benefits will not come at a cost premium – in fact, manufacturers and purchasers will actually save almost 4 billion dollars (US \$3,660,553,851) over the life of the EPEAT products sold in 2007, primarily from reductions in energy use.

The immense volume of EPEAT registered products sold worldwide in 2007, and the very significant environmental and financial benefits resulting, confirm the EPEAT system's success as a driver for environmental change in the electronic products market. Credit for these benefits goes to the many purchasers who are demanding EPEAT products, and to the manufacturers who are developing products and services to meet EPEAT's requirements and reduce environmental impact.

The Green Electronics Council anticipates robust continued growth in EPEAT product registrations and resulting benefits in coming years. As more products are designed to meet the current EPEAT standard, as standards covering additional electronic products come on line, as global use of EPEAT continues to grow, as purchasers worldwide buy more EPEAT registered products, and as the current EPEAT standard is revised to become increasingly stringent, these tangible benefits will continue to grow in scope and value.

INTRODUCTION

The EPEAT program evaluates computer desktops, laptops, and monitors based on 51 environmental criteria developed through an extensive stakeholder consensus process supported by United States Environmental Protection Agency (EPA). The Green Electronics Council, a nonprofit group established in 2006 to partner with stakeholders to improve the environmental and social performance of electronic products, manages the EPEAT product registry and verification programs, and reports on the benefits of EPEAT product sales annually as a measure of the program's impact. This document, covering EPEAT sales during calendar year 2007, is the second annual EPEAT Environmental Benefits report.

Background

Information technology has enabled significant improvements in the standard of living of much of the developed world, and through its contributions to greater transport and energy efficiency, improved design, reduced materials consumption and other shifts in current practices, may offer a key to long term sustainability. However, the production, purchase, use and disposal of electronic products such as personal computers and monitors also have significant negative environmental impacts.

As with all products, these impacts occur at multiple stages of a product's life: extraction and refining of raw materials, manufacturing to turn raw materials into finished product, use of the product, including energy consumption and emissions, and end-of-life collection, transportation, and recycling/disposal. Since computers and other electronic products have supply chains and

customer bases that span the globe, these environmental impacts are widely distributed geographically.

The Electronic Product Environmental Assessment Tool (EPEAT) program was launched in 2006 to help purchasers identify environmentally preferable electronic products as a way to begin reducing the overall environmental impacts of electronic products. The system began with a product standard and registry addressing personal computers and monitors. EPEAT's environmental performance criteria were developed through a multi-year, multi-stakeholder process supported by US EPA that included participants from the public and private purchasing sectors, manufacturers, environmental advocates, recyclers, technology researchers and other interested parties.

The development of EPEAT was prompted by a growing demand among institutional purchasers for an easy-to-use evaluation tool to enable the comparison and selection of electronic products based on environmental performance attributes. IT purchasers needed a simple way to assess products' environmental impacts, and electronics manufacturers in turn wanted consistent guidance to ensure their green design efforts met with success in the marketplace. EPEAT meets both constituencies' needs with a user-friendly system designed by all stakeholders that is accessible to purchasers and manufacturers of any size. As a result EPEAT has revolutionized the electronic product sector, with significant manufacturer and purchaser participation and an extensive registry of over 580 environmentally preferable IT products.

The EPEAT system – 51 environmental performance criteria, a registry where products meeting those criteria are listed, and a verification system for vetting product declarations – offers purchasers an easy-to-use environmental screen for products based on a wide array of lifecycle impacts. The system also provides manufacturers with guidelines for development of environmentally preferable products that will meet market demand. And it establishes competition among manufacturers to meet higher

numbers of criteria and qualify products at higher levels, which pushes innovation and environmental excellence forward. (For a detailed overview of the EPEAT system, see Appendix A)

Environmentally Preferable Electronics Purchasing

While the environmental impacts of products are complex and often are distributed in space and time, from a user's perspective there are only a few high-leverage "decision points" that drive these impacts. Users can decide:

- What to buy
- How to use the product during its life
- How and when to dispose of the product when they are done with it.

Of these decision points, the purchase decision is arguably the highest leverage, because it can increase or reduce impacts throughout the lifecycle of the product, including manufacturing, use and end of life phases.

The environmental attributes of a product are largely determined by its design. Design determines the materials used in the product, and where and how they are assembled, all of which impacts the supply chain, including extraction and processing, production and transportation, energy consumption during use, and the efficiency of end-of-life recovery. But design does not occur in a vacuum - manufacturers design products to meet market demand.

By specifying environmentally preferable products, purchasers create that market demand – sending a strong signal to manufacturers to design and manufacture greener products. When many purchasers use a centralized tool such as EPEAT, that signal is amplified and the resulting design and service changes can be much greater.

The EPEAT system encourages manufacturers to design their products to last longer, contain less hazardous mate-

rial, be more energy efficient, and be easier to upgrade and recycle. These benefits are real improvements realized in offices and communities around the world over the life of these products. By buying EPEAT registered products, purchasers are keeping significant quantities of pollutants out of the world's air, water, and landfills, conserving resources, and protecting public health from the impact of hazardous materials.

In the use phase of product life, through the requirement for ENERGY STAR compliance, EPEAT registered products eliminate the consumption of thousands of megawatt hours of electricity, and reduce related emissions, including greenhouse gases. Further improvements can be realized by extending the life of EPEAT products and recycling products responsibly at the end of their life.

EPEAT is straightforward to use, and freely available to purchasers. By requiring EPEAT-registered products, purchasers can be assured that they are buying high performance products with reduced environmental impact across a spectrum of environmental attributes, and that there will be a robust verification system in place to maintain the credibility of product declarations. All parties can review the list of EPEAT registered products and research their detailed environmental attributes at www.epeat.net.

Overall, EPEAT:

- Provides a credible assessment of electronic products based on agreed-upon criteria
- Evaluates products based on environmental performance throughout the life cycle
- Brings the U.S. market into conformance with numerous international environmental requirements
- Promotes continuous improvement in the design of electronic products; and
- Leads to reduced impact on human and environmental health.

Growth of the EPEAT program

In the short time since its inception, EPEAT is transforming the marketplace for greener computer products. The program has seen a rapid growth in the number of registered products, a rising public awareness of pressing environmental issues, growing recognition of the need for green alternatives, and a burgeoning roster of private and public purchasers using EPEAT to green their IT purchases. Such trends clearly show EPEAT's value in the world of green purchasing.

In just 18 months, beginning at launch in July 2006, the program has evolved from three participating manufacturers and 60 registered products to 27 manufacturers and more than 580 products today. Total sales of EPEAT registered products worldwide in 2007 exceeded 109 million products. Comparison of 2007 sales with sales figures reported in the 2006 Environmental Benefits report shows that purchasers are buying EPEAT registered products at 150% the annualized rate of purchasing in 2006 (More than 109 million products purchased in 2007, in contrast to an annualized rate of 72 million for 2006 sales).

Public and private purchasers have turned to EPEAT to help meet their environmental goals. In addition to the US federal government and Canadian national government, many states, provinces and cities are using EPEAT. A growing number of major business enterprises are also beginning to integrate EPEAT environmental criteria into their contracting process to address design, use and end of life impacts. At year's end 2007, the EPEAT green computer procurement system had posted more than \$50 billion in confirmed IT purchase contracts.

Numerous public and private organizations now use EPEAT:

- US Federal government agencies used EPEAT extensively throughout 2007, with NASA, the Departments of Homeland Security, Defense, Interior, Veterans

Affairs and Energy, the Executive Office of the President and EPA being major early adopters. As of February 2008, EPEAT is a required US federal government purchasing criterion embedded in the Federal Acquisition Regulations.

- The government of Canada and the New Zealand Environmental Ministry
- U.S. states, including New York, Massachusetts, Oregon, Minnesota and Wisconsin, and Canadian provincial authorities, including Nova Scotia and the Ontario Lottery
- U.S. cities such as San Francisco, Portland, OR, San Jose, Seattle, and Culver City, CA, as well as Los Angeles County and Vancouver, BC
- Large corporate buyers such as the HDR architecture firm, health care nonprofit Kaiser Permanente, hospitality giant Marriott International, international consulting firm Deloitte, Fortune 500 health services company McKesson, and Premier Health Alliance, one of the country's largest hospital groups
- Universities such as Yale, Cornell and the University of California system

The annual EPEAT Environmental Benefits Report is intended to answer the basic question whether growth in EPEAT product registration and increases in purchasers specifying and buying greener electronic products through use of EPEAT have moved the market towards environmentally preferable alternatives and had a beneficial environmental impact. The answer this year, as last, is a resounding "Yes!"

EPEAT ENVIRONMENTAL BENEFITS 2007

Estimated Environmental Benefits from 2007 EPEAT Purchasing

	Reductions	Equivalents
Electricity	42.2 Billion kWh	Annual consumption of 3,723,185 US households
Primary Materials	75.5 million metric tons	Weight of 585,092,145 refrigerators
Air Emissions	174,393,139,000 kg	174,393,139 metric tons
Water Emissions	364,789,000 kg	364,789 metric tons
Greenhouse Gas Emissions	3.31 million metric tons	Removing 2,630,619 US cars from the road for a year
Toxic Materials	3220 metric tons	Weight of 1,609,545 bricks The amount of mercury in 482,381 fever thermometers
Hazardous Waste	124,000 metric tons	Weight of 61,831,455 bricks
Cost Savings	\$3,660,553,851	

Overall Environmental Benefits

When purchasers specify and buy EPEAT registered laptops, desktops, and monitors rather than “conventional products,” a host of environmental benefits accrue over the lifetime of those products.³ Using the Electronics Environmental Benefits Calculator, developed as a means to assess the benefits of purchasing EPEAT-registered products, we can estimate the total environmental benefits that can be directly attributed to the lifetime use of the 112,907,934 EPEAT registered products purchased in 2007.

These benefits accrue from all phases of the life of the products themselves. For instance, by buying an ENERGY STAR-compliant computer, the user (and the environment) benefits from reduced power consumption over the life of the product, and that reduced energy consumption lowers the upstream material inputs and emissions associated with power generation, as well as reducing costs to the user. Similarly, when a purchaser selects a computer containing less toxic materials, these substances will not be used in manufacturing or released

into the environment at the end of the product’s life. So, the reported benefits are the result of an informed purchase decision but are realized over time and in multiple places. (For a detailed explanation of how the benefits reported here are assessed, please see the Methodology section and Appendix C.)

The results reported below are based on evaluation of the environmental impacts resulting from sale of 109,927,587 EPEAT-registered products throughout the world in 2007 – including just under 36 million desktops, just under 49 million monitors and more than 24 million laptop computers.

The environmental benefits are enormous – 2007 purchases of EPEAT registered laptops, desktops, and monitors over conventional products will:

- Reduce use of primary materials by 75.5 million metric tons, equivalent to the weight of more than 585 million refrigerators
- Reduce use of toxic materials, including mercury, by 3,220 metric tons, equivalent to the weight of 1.6 million bricks
- Eliminate use of enough mercury to fill 482,381 household fever thermometers

³ The EEBC assumes a 4-year lifetime when calculating energy savings for desktops and monitors, and a 3-year lifetime for notebooks. All benefits figures in this report were calculated using the EEBC Version 1.1, dated 4/18/07

- Avoid the disposal of 124,000 metric tons of hazardous waste, equivalent to the weight of almost 62 million bricks

In addition, due to EPEAT's requirement that registered products meet ENERGY STAR's energy efficiency specifications, these products will consume less energy throughout their life, resulting in:

- Savings of 42.2 billion kWh of electricity – enough to power 3.7 million U.S. homes for a year
- Elimination of the release of 174 million metric tons of air emissions (including greenhouse gas emissions) and almost 365 thousand metric tons of water pollutant emissions
- Reduction of 3.31 million metric tons of carbon equivalent (MTCE) greenhouse gas emissions – equivalent to removing over 2.6 million US cars from the road for a year

Cost Savings

In addition to these enormous environmental benefits, the purchase of products meeting EPEAT's design and performance criteria results in significant cost savings, which are also measured by the EEBC. At the Silver Tier, which is assumed for all products reported in the 2007 purchase figures, cost savings are primarily based on reduced energy consumption during the products' use phase. These reductions result from the EPEAT requirement to meet ENERGY STAR specifications. The cost savings resulting from 2007 purchases of these EPEAT/ENERGY STAR compliant products amount to an estimated US \$3,660,553,851 over the life of the products.

Underestimation of Benefits

The results listed above are calculated using a general, relatively conservative set of assumptions about the attributes of Silver level EPEAT registered products. These assumptions are discussed in detail in the Methodology section of this report, but it is worth mentioning that

many EPEAT-registered products purchased in 2007 may exceed them. For example, many registered products met optional toxics reduction criteria beyond those assumed; others met ENERGY STAR's 4.0 standard for computers early; some products incorporated higher levels of recycled content than those assumed generally.

In addition, our calculations are likely to underestimate the lifecycle cost benefits of EPEAT purchasing somewhat. For those specific products containing higher (optional) levels of recycled content, additional cost savings are likely to accrue in the manufacturing phase due to differences in material and energy inputs. In addition, manufacturer takeback and recycling of products and packaging may reduce costs related to waste disposal – but we have not included end of life management costs in the benefits calculations. Thus the figures above may to some degree underestimate the actual cost savings to all parties through the lifecycle of the products purchased in 2007.

Assessing such additional environmental and cost benefits from EPEAT purchasing is beyond the scope of this report, but worth noting in general terms.

See Appendix D for Environmental Benefits by Product Type

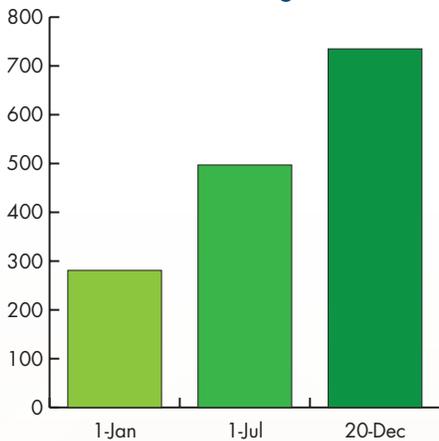
See Appendix E for Environmental Benefits by Geographic Purchase Region

BACKGROUND AND TRENDS

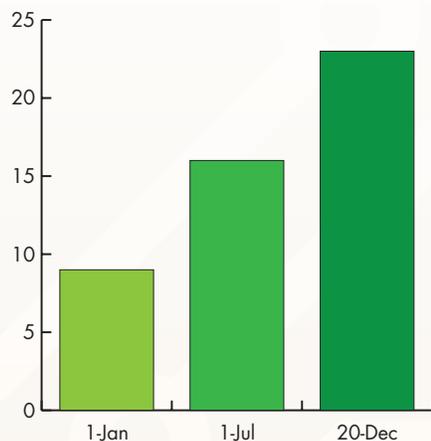
Growth in EPEAT registration and participation

2007 witnessed a phenomenal growth in manufacturer participation and EPEAT product registrations. In January 2007 there were nine participating manufacturers and 281 registered products, with no products qualifying at Gold level. By July 2007 six products were registered at Gold, with 16 manufacturers participating, and 497 products in total. By year's end the registry comprised 735 products, with 23 manufacturers participating and 29 Gold products registered.⁴

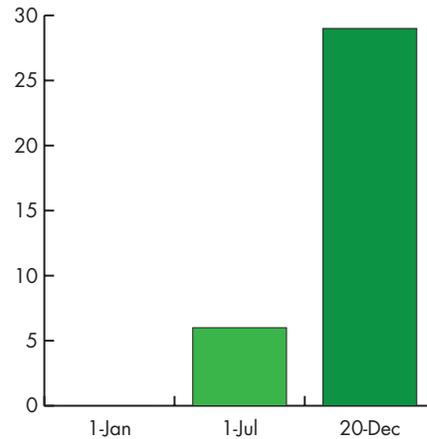
Increase in Product Registration, 2007



Increase in Manufacturer Participation, 2007



Increase in Gold Products, 2007



Market presence

Around the world, EPEAT is beginning to represent a growing proportion of total unit sales of computers. For example, total 2007 unit sales of 60,021,553 EPEAT registered desktops and laptops constituted 22 percent of worldwide desktop and laptops shipped in 2007 (261,596,059). The proportion of EPEAT registered products purchased is higher in the United States than elsewhere in the world – nearly 40% of unit sales of desktops, for example - but the percentages in other regions are growing rapidly.

EPEAT Percentage of Total Unit Sales

Region	Desktops	Notebooks
US	39.75%	34.56%
Canada	30.17%	20.48%
Rest of World	19.36%	17.56%

Note: These percentages relate to total unit sales of the product type as reported by IDC, not the percentage of "models" currently on the market that are EPEAT registered

⁴ The number of registered products decreased once again in January 2008 when the final deadline for ENERGY STAR 4.0 compliance came into effect

Growth in EPEAT-registered Product Sales

Total adjusted unit sales of EPEAT registered products are exploding, both in the United States and globally, from an annualized sales volume of approximately 73 million in 2006 (based on the 36.5 million products sold in the six months of 2006 that the system operated) to over 109 million in 2007. Purchases of EPEAT registered products skyrocketed in some regions. For example EPEAT desktop sales in Canada went from 172 thousand in 2006 to 983 thousand in 2007, and outside the US and Canada, EPEAT registered monitor purchases rose from just under 9 million in 2006 to over 28 million in 2007.

2007 Unit Sales of EPEAT Registered Products

Region	Desktops	Notebooks	Monitors	Integrated Systems	TOTAL
USA	12,403,405	10,375,874	18,883,816	1,196,621	42,859,716
CANADA	983,029	561,096	1,606,612	0	3,150,737
REST OF WORLD	22,478,991	13,219,158	28,218,926	59	63,917,134
TOTAL	35,865,425	24,156,128	48,709,354	1,196,680	109,927,587

Between the EPEAT system launch in July 2006 and the end of 2007, the cumulative sales total for EPEAT registered products has risen to more than 146 million total units worldwide. In total, an estimated \$40 billion in EPEAT purchasing contracts were in place by the end of 2007.

EPEAT Benefits Trend over Time

The 2007 EPEAT Environmental Benefits figures show a significant increase over those noted in our 2006 Environmental Benefits Report, testifying to the EPEAT system's increasing scope and effectiveness in the marketplace.

2006 to 2007 EPEAT Environmental Benefits Comparison

Benefit	2006	2007	Increase in benefits/reductions
Electricity <i>(from ENERGY STAR)</i>	↓ 13.7 billion	↓ 42.2 billion	+28.5 billion kWh
Primary materials	↓ 24.4 million	↓ 75.5 million	+51.1 million MT
Air emissions <i>(from ENERGY STAR)</i>	↓ 56.5 million	↓ 174 million	+117.5 million MT
Greenhouse gas emissions <i>(from ENERGY STAR)</i>	↓ 1.07 million	↓ 3.31 million	+ 2.24 million MTCE
Water emissions <i>(from ENERGY STAR)</i>	↓ 118,000	↓ 364,000	+246,000 MT
Toxic materials used	↓ 1,070	↓ 3,220	+2150 MT
Hazardous waste	↓ 41,100	↓ 124,000	+82,900 MT

How EPEAT sales data is gathered and reported

As part of their annual agreement with EPEAT, manufacturers that register products in the system are required to report the global unit sales of their EPEAT registered products (notebook computers, desktop computers, integrated desktop systems, and computer monitors) to EPEAT through the Information Technology Industry Council (ITI), an industry trade association that acts as a data consolidator for this process. The ITI preserves the confidentiality of each manufacturer's individual data, and forwards the aggregated data to the Green Electronics Council.

The reported sales data is a record of all global purchases of EPEAT registered products. Manufacturers reported total sales in 2007 of their EPEAT-registered products – not only the sales to purchasers that required EPEAT, or the sales because of EPEAT. The assumption for measuring benefits from these total sales is that EPEAT motivated the redesign of registered products and related services, whether or not purchasers understood that they were receiving the resulting benefits when they selected a specific computer or monitor.

All reported sales for 2007 were entered into the Electronics Environmental Benefits Calculator (EEBC), which calculates the environmental benefits of the sale or purchase of all EPEAT registered products sold in a specified time frame.

Electronics Environmental Benefits Calculator

The Electronics Environmental Benefits Calculator (EEBC) is a tool developed to support and evaluate purchase of EPEAT and other environmentally preferable electronics. The tool was developed by the University of Tennessee Center for Clean Products and Clean

Technologies under a Cooperative Agreement with the U.S. EPA. The EEBC measures quantifiable benefits (such as green house gas reductions, waste avoided, pounds of mercury eliminated) of specific EPEAT (and other electronics) purchases over purchase of comparable conventional products.

The EEBC tool estimates environmental benefits for eight metrics:

- Energy savings
- Greenhouse gas reduction
- Solid waste reduction
- Primary material savings
- Hazardous waste reduction
- Toxic material reduction
- Air emissions
- Water emissions

The EEBC is currently available in an Excel spreadsheet format and can be viewed at <http://eerc.ra.utk.edu/ccpct/eebc/eebc.html>. The EEBC's primary purchasing data input is the number and type of EPEAT registered products purchased. The tool calculates the environmental benefits resulting from the purchase of a specific number of EPEAT registered products, based on a comparison of EPEAT product attributes, such as material composition and energy consumption, to the average attributes of a composite conventional product.⁵

The calculations variably include impacts from raw material extraction and processing, product manufacture, and product use and disposition, depending on the specific metric involved.⁶ Data for greenhouse gas reduction, primary material savings, and air and water emissions may be proportionally greater than other metrics because they

5 For an explanation of how the "conventional product" model was developed, see the Calculator itself at http://eerc.ra.utk.edu/ccpct/eebc/EEBCTool_Version%201_1.xls, Sheet #8a Assumptions – Baseline

6 The use of life cycle data in benefits calculations varies depending on the metric and EPEAT criterion. Discussion at <http://eerc.ra.utk.edu/ccpct/eebc/EEBCFAQJuly2007.pdf> For a complete summary of benefits calculations, see Appendix

include inputs and outputs from all phases of product life, including those from upstream processes.

To obtain more precise measures of environmental benefit based on specific products purchased, EEBC users may enter data on the particular optional criteria a given product meets. Users may also enter data on end of life disposition of products (reuse, recycling or disposal) in order to assess the environmental benefits of each end of life strategy. The EEBC explicitly outlines all the assumptions for EPEAT and “conventional” products so that users can review all data inputs.

Report Assumptions

The environmental benefits detailed in this report were obtained by entering the total number of EPEAT registered products sold in 2007 into the EEBC by product category, with some specific choices:

- We assumed EPEAT Silver registration for all product types. This is a reasonable assumption, given that more than 85 percent of all registered units during 2007 were registered as EPEAT Silver, and many purchasers were specifying EPEAT Silver.
- Since we do not have sufficiently detailed information about the exact composition of the individual products purchased worldwide to apportion individual attributes accurately, we used the generic assumptions for the EPEAT Silver product tier.⁷
- For the purposes of calculation, each Integrated System (e.g. a product where the CPU and Monitor are part of a single unit) was counted as one laptop. The EEBC has no separate category for calculating the benefits of purchasing one Integrated System over another; given their small market share and similarity to laptops we do not expect this to skew results unduly.

⁷ For the specific criteria assumptions for EPEAT Silver, see the EEBC tool, sheet 8b2 – “Assumption – EPEAT Tiers”

- Finally, although EPEAT includes a mandatory requirement for manufacturers to provide end of life takeback and recycling of all registered products, we do not have sufficient information about the end of life disposition of EPEAT-registered products to assess those benefits, or to evaluate how much the EPEAT requirement contributed to their end of life handling. Therefore we included no environmental benefits from end of life management in the figures reported here.

Important Notes

The EEBC is an excellent tool and has been carefully reviewed by EPA and other independent scientists. However, like any lifecycle impact calculator, the EEBC tool employs methodological and data assumptions that are open to argument and to improvement. In addition, data culled from the EEBC can be interpreted in a wide variety of ways. We encourage readers to carefully review the methodology described here and in the EEBC itself in order to correctly interpret the results.

In addition, some of the significant environmental benefits resulting from individual EPEAT criteria (such as ease of product disassembly, corporate reporting criteria, and providing a product take back option) are not easily quantified and therefore are not included in the EEBC. Given these omissions, the real environmental benefits of the EPEAT system may actually be underestimated in our calculations. (See Appendix C for detailed explanation of which benefits (or metrics) are calculated for each criterion within the EEBC tool.)

Finally, three main points provide general context for the environmental benefits reported here:

- As noted earlier, manufacturers report their total sales of EPEAT-registered products – not only the sales to purchasers that required EPEAT. In addition, many of EPEAT’s environmental criteria are also requirements

of other programs or regulatory schemes, including ENERGY STAR and the EU's RoHS and WEEE regulations. Therefore the environmental benefits reported here cannot be characterized as resulting solely from EPEAT.

- EPEAT's role is as a channel for demand of specifically environmentally preferable products, not as a creator of those products in itself. Credit for the development of products that meet EPEAT's environmental performance criteria lies with researchers who have developed enabling technologies, with environmental advocates and purchasers who have demanded more environmentally responsible products, and with manufacturers who have designed and manufactured greener products.
- The environmental benefits reported here come from the purchase of EPEAT registered products. That said, the benefits accrue from all phases of the life of the products themselves. So, the reported benefits are the result of an informed purchase decision, yet may be realized over time and in multiple places. Many other benefits may accrue if purchasers take advantage of management options such as unified power management software, refurbishment and resale or donation programs, and responsible recycling. Such activities, however, are not assessed in this report.

EPEAT brings many strands of innovation and environmental improvement together into a single tool that is easily used and that clearly lays out an overall scheme for product and service design – that is the system's value in the marketplace and its role in motivating the environmental benefits enumerated in this report.

CONCLUSION

Demonstrable Benefits

The Green Electronics Council's first annual report on the environmental benefits of the purchase or sale of EPEAT registered products covered the last six months of 2006, the year EPEAT was formally launched. Coming so soon after the system's launch, it offered only a glimpse of the impact EPEAT could have on the market, on product innovation and on the environment. This 2007 report validates the promise of the EPEAT program for motivating the design, manufacturing and purchase of environmentally preferable personal computers and monitors. And the results are compelling.

Evidence now clearly demonstrates:

- **Significant market impact** – A growing proportion of total unit sales of computers worldwide are EPEAT registered. Nearly 23 percent of worldwide total sales of desktops and laptops are EPEAT registered today.
- **Growing program participation** – From 9 participating manufacturers and 281 registered products at the outset of 2007 to 25 manufacturers and over 575 products today.
- **Phenomenal environmental benefits** – Purchasers, manufacturers and the general public can now see the significant benefits of EPEAT purchasing for preservation of natural resources, and reductions of harmful toxins and hazardous waste, air and water pollutants.

System Expansion

Based on these findings, we anticipate robust continued growth in EPEAT registrations and impacts.

As U.S. government agencies continue to purchase EPEAT-registered computer equipment to replace non-qualified electronic products, a mandate that became official in February 2008, EPEAT product sales to the U.S. government are expected to grow substantially in the coming year and beyond.

By purchasing environmentally preferable electronic products, more and more purchasers are sending strong and compelling signals to electronics manufacturers to design and manufacture greener products. We expect this gradual shift to have a marked positive impact on the global market and the environment.

As demand for EPEAT products grows, the program will adapt as well. EPEAT today applies only to laptop and desktop computers and computer monitors, but stakeholder processes are underway to develop new standards which will expand the system to additional electronic product types – printers and imaging devices, servers, TVs and mobile devices (cell phones, PDAs).

In addition, given the significant benefit of EPEAT purchases made outside the North American market where EPEAT's outreach and promotion activities have primarily occurred, there is the potential for huge increases in utilization of the EPEAT system around the world, and corresponding growth in the resulting environmental benefit.

What it Means

The EPEAT system's combination of stakeholder involvement and support, multi-attribute assessment, web-based registry, transparent verification and demonstrable benefit have made it the tool of choice for thousands of environmentally aware purchasers of personal computer hardware.

By creating a channel for purchasers and manufacturers to reach consensus on what "environmentally preferable" means at a given point in time, and by promising significant market rewards to manufacturers who compete to offer a wide array of high performing, cost-comparable products that meet the highest levels of EPEAT qualification, the system has contributed to a sea change in PC purchasing, and will continue to move the market for environmentally preferable electronic products forward – with the goal of creating a continually challenging set of performance criteria to motivate and reward change for the better in this product category.

Visit www.epeat.net for more details on the EPEAT system, including a searchable product database, the EPEAT criteria, lists of participating manufacturers and purchasers, model specification language and archived media coverage.

For additional information or assistance with EPEAT purchasing initiatives, contact **Sarah O'Brien**, Outreach Director for the Green Electronics Council, at (802) 479-0317, or sarah.obrien@greenelectronicscouncil.org.

APPENDIX A: EPEAT BASICS

The Electronic Product Environmental Assessment Tool is a system for identifying environmentally preferable personal computers and monitors.

Development

EPEAT was developed over three years by a large group of stakeholders including environmental advocacy organizations, institutional purchasers, electronics manufacturers, the U.S. EPA and other government officials, electronics recyclers, researchers, and others, in a process supported by the US EPA and facilitated by an independent non-profit organization. The draft EPEAT criteria and system developed by this working group were balloted, revised and accepted by the Institute of Electrical and Electronic Engineers (IEEE) through an ANSI-accredited process, becoming IEEE Public Standard 1680 for the Environmental Assessment of Personal Computer Products.

Registered products

EPEAT registered products are high-performance business-class computers that cost no more on the whole than comparable products that do not meet EPEAT's criteria. Compared to traditional computer equipment, however, all EPEAT registered computers have reduced levels of cadmium, lead, and mercury to better protect human health and the environment. They are more energy efficient (meeting ENERGY STAR specifications), which reduces power consumption and related emissions of global warming gases, and they are also easier to upgrade and recycle.

Environmental Criteria

The EPEAT program compares computer desktops, laptops, and monitors based on 51 environmental criteria across eight performance categories:

- Reduction/elimination of environmentally sensitive materials;
- Materials selection;
- Design for end of life;
- Product longevity/life cycle extension;
- Energy conservation;
- End of life management;
- Corporate performance; and
- Packaging.

Based on the IEEE 1680 Standard, all EPEAT registered products must meet a minimum of 23 environmental performance criteria, placing them at the “Bronze” level. Required criteria include compliance with the current applicable ENERGY STAR standard, compliance with the EU’s RoHS Directive (which requires reduction or elimination of 4 toxic heavy metals and two classes of brominated flame retardants) and provision of a takeback and recycling program for the product by the manufacturer.

Ratings Tiers

An additional 28 optional criteria across the environmental performance categories are used to determine whether products earn higher level EPEAT Silver or Gold recognition. Manufacturers select among the optional criteria to achieve higher EPEAT ratings, as follows:

- **Bronze** – product meets all 23 required criteria.
- **Silver** – product meets all required criteria plus at least 50% of the optional criteria.
- **Gold** – product meets all required criteria plus at least 75% of the optional criteria.

Financial Support

The Green Electronics Council's EPEAT management activities include maintenance of the website and registry, EPEAT promotion through direct assistance to purchasers and media outreach, verification program management, support of EPEAT's Board of Advisors (a stakeholder group that guides the system's operations and development), and responding to all inquiries by purchasers, manufacturers, government agencies and other interested parties. EPEAT received start-up funding from the US EPA but on an on-going basis is supported entirely by annual fees paid by participating manufacturers to register their qualified products in the EPEAT system. The fee is independent of the number of products registered, for two reasons: 1) to eliminate direct linkage between numbers of products registered and system income, avoiding the potential conflict of interest where program income depends on maintaining and increasing numbers of registered products; and 2) to promote the registration of as many conforming products as possible, since the direct cost per product to manufacturers is reduced with every additional registration.

Verification

Similar to ENERGY STAR, EPEAT is based on self-declaration by manufacturers that their products meet the criteria of the IEEE 1680 Standard, combined with regular audits of the registry to assure the accuracy of declarations. The EPEAT approach requires active and tough auditing of the registered product set both on a random and on a "for cause" basis, with public disclosure of the verification results, to assure that the Registry is accurate. There is no advance warning of verification – manufacturers must be able to provide verification information at any time it is requested. EPEAT's verification system is designed to include multiple levels of scrutiny of manufacturer declarations, including strategic investigation of especially difficult-to-meet criteria across the entire registered product set, individual verification of

criteria declarations that appear questionable, and regular rounds of verification addressing selected subsets of the criteria. Verifications are of two types – those based on evidence provided by the manufacturer and/or their suppliers, and those based on examination of the product.

For much more detail on EPEAT including sample contract language, media coverage, manufacturer and purchaser lists, detailed criteria and more, visit www.epeat.net.

APPENDIX B: EPEAT PARTICIPATING MANUFACTURERS

2007 EPEAT Participating Manufacturers	
APPLE	NEC DISPLAY SOLUTIONS INC.
CIARA-TECH	NORTHERN MICRO
CTL CORPORATION	ONE LAPTOP PER CHILD
DELL	PANASONIC
ENANO COMPUTERS	PHILIPS ELECTRONICS LTD.
FUJITSU COMPUTER SYSTEMS	PROSYS TECH CORP.
HEWLETT PACKARD	SAMSUNG ELECTRONICS AMERICA
HYUNDAI IT AMERICA	SONY ELECTRONICS INC.
LENOVO	TOSHIBA
LG ELECTRONICS USA INC.	VIEWSONIC CORP
MDG COMPUTERS CANADA	ZONBU
MPC COMPUTERS	

EEBC COMPARISONS AND EQUIVALENCIES

APPENDIX C

The Electronics Environmental Benefits Calculator allows one to estimate a number of key environmental benefits (saved electricity in kWh, reduced air and water emissions, solid waste generation, etc.) expected to result from the purchase of EPEAT registered products in comparison with conventional products of the same type. To put the result in perspective, the EEBC provides equivalencies for those results. **Table 1** here describes the differences measured between EPEAT registered and conventional products and the assumptions behind them. **Table 2** describes how the benefits equivalencies are derived. For more detailed explanations of all the assumptions and data sources for the EEBC, go to the calculator tool itself at <http://eerc.ra.utk.edu/ccpct/eebc/eebc.html>.

TABLE 1: Savings Assumptions

Criteria/Attributes		
reference	description	Metrics
PURCHASING		Benefits calculated for purchasing are based on benefits that might occur as a result of purchasing decisions (thus can have savings in upstream, manufacturing, use or EOL life-cycle stages of the product).
Reduced Toxicity		All reduced toxicity calculations compare the user-inputted purchase data for a unit to a pre-EPEAT baseline (conventional) unit.
E 4.1.1.1	RoHS compliance - Pb, Hg, Cd, Cr6+, PBB, PBDE	Toxic material savings: direct reduction in the amount of toxic material (e.g., lead) in purchased product compared to baseline unit. Haz waste savings: the addition of toxic materials to a component (e.g., lead in a printed circuit board, wire and cable or CRT glass) can render the entire component hazardous if landfilled. This metric takes into account the reduction in hazardous components (by weight) at the EOL resulting from the avoidance of toxic material in the purchased product. Note the Hg RoHS criterion excludes lamps and cathode ray tubes.
E 4.1.3.1-2	Hg in light source; max avg of 3 mg Hg/lamp	Toxic material savings: gives credit if product has max level of 3 mg of Hg in lamp, based on direct reduction in the amount of toxic material in purchased product compared to baseline unit. Haz waste savings: not calculated here since it would be repetitive of savings calculated under the RoHS-Hg criterion.
E 4.1.3.3	Hg-free lamps	Toxic material savings: direct reduction in amount of toxic material in purchased product compared to baseline unit. If Hg-free lamps selected, benefits from this criterion override the previous one for max of 3 mg. Haz waste savings: not calculated here since it would be repetitive of savings calculated under the RoHS-Hg criterion.
Material Use		Savings are based on the amount of virgin resins not produced due to the replacement of virgin resin with recycled content in the products as compared to a pre-EPEAT baseline, which is currently assumed to have zero recycled content in the product resins. These calculations use data from the average of three typical resins in computers: ABS (acrylonitrile-butadiene-styrene), HIPS (high impact polystyrene), and PC (polycarbonate).
E 4.2.1.1-3	Recycled content (RC) of product resin	Energy, primary material, total air emissions, and water emissions savings: based on all energy used, materials used, air releases and water releases, respectively, from producing the virgin resins (including materials extraction and processing associated with resin production; this life-cycle data are from European sources: BUWAL and APME, see Sheet 8c, Table 7).

Criteria/Attributes		
reference	description	Metrics
		<p>GHG emissions savings: based on GHG emissions (i.e., a subset of air emissions that have global warming potential); as above, based on the materials extraction and processing of the three resins; data also based on BUWAL and APME.</p> <p>MSW savings: assumes the average amount of recycled content in the product resins is the amount of solid waste saved. Note, this does not include all solid waste from materials extraction, as other metrics above, as these data were not readily available for Version 1.0. Note, Haz waste savings are not included since the resins themselves are not hazardous wastes and all hazardous waste from materials extraction and processing data were not readily available for version 1.0.</p> <p>Cost savings: cost of electricity of energy savings calculated above. For cost estimation purposes, this simply assumes that all production energy to produce the resins is electric energy.</p>
Packaging		Savings are based on the amount of virgin packaging materials (corrugated cardboard or resins) that are not produced due to the recycled content (RC) of the packaging as compared to a pre-EPEAT baseline, which is assumed to have zero recycled content in the packaging. Zero recycled content was chosen as the baseline in order to calculate the total benefit of RC, not just the incremental benefit of increasing RC. For resin packaging, these calculations use data from the average of four typical resins in packaging LDPE (low-density polyethylene), HDPE (high-density polyethylene), PET (polyethylene terephthalate) and PS (polystyrene).
E 4.8.3.1-2	Avg. RC of packaging: 1-corrugated, 2-plastic/foam, 3-other	Energy, primary materials, GHG, total air emissions, water emissions, solid waste, and cost savings: Same as “Recycled content of product resin” (above under “Material Use”), but specific to the packaging type. Note, packaging type 2 and 3 are both based on average data for the four common packaging resins: LDPE, HDPE, PET, and PS.
E 4.8.3.1-2	CPG min 25% for recycled content-corrugated	Energy, primary materials, GHG, total air emissions, water emissions, solid waste, and cost savings: Same as RC of packaging-corrugated except this assumes 25% recycled content if this item checked in Sheet 3c, or if the EPEAT tier chosen in Sheet 3a defaults to meeting the Comprehensive Procurement Guidelines (CPG).
E 5.8.5.1	Packaging avoided per unit by packaging reuse	Energy, primary materials, GHG, total air emissions, water emissions, solid waste, and cost savings: Assumes a package is reused 5 times and savings are based on not producing the packaging 5 times, as compared to the baseline, where no reuse is assumed. Otherwise, these calculations are the same as for RC of packaging or product resins, except instead of savings based on RC, it is based on the amount not produced for an entire package.
Energy		Savings are based on the future use of a purchased product, which is compared to a pre-EPEAT (non-ENERGY STAR) product.
E 4.5.1.1 & 3	ENERGY STAR 3.0 or 4.0	<p>Energy savings: based on the unit energy consumption (UEC) of a product over the life of the product.</p> <p>Primary material savings, GHG, total air emissions, and water emissions savings: use life-cycle data for materials and emissions associated with the use of electricity, based on the energy savings calculated under “energy savings” above.</p> <p>Cost savings: cost of electricity calculated under “energy savings” above.</p>

TABLE 2: Equivalencies

METRIC	UNIT	REFERENCE
Annual household energy use	11,340 kWh/household/year	US Technology Cooperation Gateway, Greenhouse Gas Equivalencies Calculator, http://www.usctcgateway.net/tool/
Annual passenger car emissions	4.62 metric tons CO ₂ equivalents/passenger car/year 1260 kg CE/passenger car/yr	US Technology Cooperation Gateway, Greenhouse Gas Equivalencies Calculator, http://www.usctcgateway.net/tool/
Annual municipal solid waste (MSW) generation per U.S. household	1931 kg MSW/household/year Assumes 4.54 lbs MSW/person/day; 2.57 average people/household	U.S. EPA, Municipal Solid Waste in the United States: 2005 Facts and Figures, October 18, 2006 & US Census Bureau, March 2005 Current Population Survey, American Families and Living Arrangements 2005, Table AVG1 (http://www.census.gov/population/socdemo/h)
Weight of refrigerator	129 kg (285 lbs)/ full-size refrigerator	Average of 10 full-size refrigerators offered for sale at Best Buy (www.bestbuy.com) in Nov. 2006, ranging in size from 18 Cu Ft to 26 Cu Ft capacity.
Weight of bricks	2 kg (4.5 lbs)/brick	Manufacturer technical data. Standard brick defined as 3 5/8" X 2 1/4" X 8"
Amount of mercury in a fever thermometer	0.61g Hg/thermometer Assumes 95 percent of clinical thermometers are oral/rectal/baby thermometers, which contain approximately 0.61 grams of mercury.	US Environmental Protection Agency, Mercury Study Report to Congress, Volume II: an Inventory of Anthropogenic Mercury Emissions in the United States. EPA-452/R-97-004, December 1997

APPENDIX D: ENVIRONMENTAL BENEFIT BY PRODUCT CATEGORY

ENVIRONMENTAL BENEFITS OF 2007 EPEAT DESKTOP PURCHASES (CPUs)

kWh of electricity <i>(from ENERGY STAR)</i>	↓ 2.93 billion
Primary materials	↓ 5.24 million metric tons
Air pollutant emissions <i>(from ENERGY STAR)</i>	↓ 12.1 million metric tons
Carbon equivalent greenhouse gas emissions <i>(from ENERGY STAR)</i>	↓ 229,000 metric tons
Water pollutant emissions	↓ 25,307 metric tons
Toxic materials used	↓ 1,888 metric tons
Hazardous waste	↓ 58.7 thousand metric tons

ENVIRONMENTAL BENEFITS OF 2007 EPEAT NOTEBOOK PURCHASES

kWh of electricity <i>(from ENERGY STAR)</i>	↓ 3.1 billion
Primary materials	↓ 5.6 million metric tons
Air pollutant emissions <i>(from ENERGY STAR)</i>	↓ 13 million metric tons
Carbon equivalent greenhouse gas emissions <i>(from ENERGY STAR)</i>	↓ 246,000 metric tons
Water pollutant emissions	↓ 27,097 metric tons
Toxic materials used	↓ 211 metric tons
Hazardous waste	↓ 16,716 metric tons

ENVIRONMENTAL BENEFITS OF 2007 EPEAT MONITOR PURCHASES

kWh of electricity <i>(from ENERGY STAR)</i>	↓ 36 billion
Primary materials	↓ 64.4 million metric tons
Air pollutant emissions <i>(from ENERGY STAR)</i>	↓ 149 million metric tons
Carbon equivalent greenhouse gas emissions <i>(from ENERGY STAR)</i>	↓ 2.8 billion metric tons
Water pollutant emissions	↓ 311,042 metric tons
Toxic materials used	↓ 1,255 metric tons
Hazardous waste	↓ 47,443 metric tons

ENVIRONMENTAL BENEFITS OF 2007 EPEAT INTEGRATED SYSTEM PURCHASES

kWh of electricity <i>(from ENERGY STAR)</i>	↓ 155 million
Primary materials	↓ 2.78 million metric tons
Air pollutant emissions <i>(from ENERGY STAR)</i>	↓ 641,750 metric tons
Carbon equivalent greenhouse gas emissions <i>(from ENERGY STAR)</i>	↓ 12,200 metric tons
Water pollutant emissions	↓ 1342 metric tons
Toxic materials used	↓ 10,400 kg
Hazardous waste	↓ 828 metric tons

Integrated systems treated as Notebook computers for this estimate calculation.

APPENDIX E: EPEAT ENVIRONMENTAL BENEFITS BY GEOGRAPHIC REGION OF PURCHASING

Since the EPEAT 2007 sales figures are reported by several geographic regions, we can project the portion of the benefits accrued by EPEAT purchasing that is attributable to purchasing in each of those geographic regions. Of course, these are life-cycle impacts that may occur in other times and places than those when and where an individual product is bought, so these benefits will not occur only in or to the areas where their purchase occurs.

ENVIRONMENTAL BENEFITS OF 2007 US PURCHASING

Benefit Category	Savings	Equivalent
Energy <i>(from ENERGY STAR)</i>	16.5 billion kWh	Yearly energy consumption of 1,452,571 US households
Primary Materials	29.4 million metric tons	Weight of 228,269,012 refrigerators
Air emissions <i>(from ENERGY STAR)</i>	68 billion kg	68 million metric tons
GHG emissions <i>(from ENERGY STAR)</i>	1.29 million MTCE	Removing 1,026,315 US cars from the road for a year
Water emissions <i>(from ENERGY STAR)</i>	142 million kg	142,319 metric tons
Toxic Materials	1.19 million kg	Weight of 634397 bricks, including 198,613 fever thermometers' worth of mercury
Hazardous Waste	46.7 million kg	23346487 bricks
Cost savings	\$1.43 billion	

ENVIRONMENTAL BENEFITS OF 2007 CANADA PURCHASING

Benefit Category	Savings	Equivalent
Energy <i>(from ENERGY STAR)</i>	1.34 billion kWh	Yearly consumption of 118,214 US households
Primary Materials	2.4 million metric tons	Weight of 18,577,169 refrigerators
Air emissions <i>(from ENERGY STAR)</i>	5.54 billion kg	5.54 million Metric Tons
GHG emissions <i>(from ENERGY STAR)</i>	105 million kg	Removing 83,524 US cars from the road for a year
Water emissions <i>(from ENERGY STAR)</i>	11.6 million kg	11,582 Metric Tons
Toxic Materials	91,400 kg	Weight of 47,030 bricks, including 15,009 fever thermometers' worth of mercury
Hazardous Waste	3.56 million kg	Weight of 1,780,677 bricks
Cost savings	\$116 million	\$116,225,669

ENVIRONMENTAL BENEFITS OF 2007 'REST OF WORLD' PURCHASING

Benefit Category	Savings	Equivalent
Energy <i>(from ENERGY STAR)</i>	24.4 billion kWh	Yearly consumption of 2,152,400 US households
Primary Materials	43.6 billion kg	Weight of 338,245,964 refrigerators
Air emissions <i>(from ENERGY STAR)</i>	100.8 billion kg	100.8 million metric tons
GHG emissions <i>(from ENERGY STAR)</i>	1.92 billion kg carbon equivalent	Removing 1,520,780 US cars from the road for a year
Water emissions <i>(from ENERGY STAR)</i>	211 million kg	210,887 metric tons
Toxic Materials	1,930,000 kg	967,392 bricks, including 274,644 fever thermometers' worth of mercury
Hazardous Waste	73.4 million	Weight of 3,670,437 bricks
Cost savings	\$ 2.12 billion	\$2,116,192,428

ABOUT THE GREEN ELECTRONICS COUNCIL

The Green Electronics Council is a program of the [International Sustainable Development Foundation](#) which is a 501(c)(3) not-for-profit organization located in Portland Oregon. The GEC was established in 2006 with a mission to inspire and support the effective design, manufacture, use and recovery of electronic products to contribute to a healthy, fair and prosperous world. Through its partnerships with the electronics industry and environmental organizations, government agencies, manufacturers and other interested stakeholders, the GEC:

- Implements market-driven systems to recognize and reward environmentally preferable electronic products; and
- Builds the capacity of individuals and organizations to design and manage the life cycle of electronic products to improve their environmental and social performance.

EPEAT is currently GEC's major project. However, in September of 2008, in partnership with the Yale Center for Green Engineering and Green Chemistry, GEC is hosting a forum to develop a vision and definition of "Sustainable Information and Communications Technology." In addition, GEC also conducts and publishes research related to electronics and the environment.

For more information, see www.greenelectronicscouncil.org.