DESIGN FOR ENVIRONMENT REPORT 2014

ELECTRONICS PRODUCT STEWARDSHIP CANADA

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MESSAGE FROM ELECTRONICS PRODUCT STEWARDSHIP CANADA (EPSC) BOARD

Board Members (L to R)
Peter Maddock, Panasonic Canada Inc.;
Daniel Francisco, Canon Canada Inc.;
Susan Winter, Electro-Federation Canada;
Nick Aubry, Sony of Canada Ltd.;
Lloyd Bryant, ***Chair,*** Hewlett-Packard (Canada) Co.;
Shelagh Kerr, ***President & CEO***, EPSC;
Jeff Van Damme, Samsung Electronics Canada Inc.

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Mary Sheveland, Cisco Systems Inc.;
Bill Munson, Information Technology Association of Canada;
Ginette Best, IBM Canada Ltd.;
John Yeider, Apple Canada Inc.;
Rene Zanin, Toshiba of Canada Ltd.;
Deborah Sanders, Dell Canada Inc.

REDUCE

The overall weight of electronics products have been dramatically reduced

Computer programs are being upgraded with the click of a mouse rather than the purchase of a new device.

REUSE

Mobile connected devices have a growing reuse market.

RECYCLE

Electronics recycling programs have expanded right across the country.

EPSC is proud to release the 2014 Design for Environment Report. This year's report explores the progress electronics manufacturers have made in Canada on the three R's waste hierarchy: Reduce, Reuse, and Recycle.

The electronics sector has made a shift to more mobile, multi- functional and light weight products. This past year more and more electronics products have been freed from cables and plugs and become mobile. This trend has made a positive impact on the increased ability for today's electronics to be reused and refurbished.

The Waste Hierarchy 3 R's of Reduce, Reuse, and Recycle are being well maintained, in that order, by the leading electronics brands.

Canadians consistently support programs to improve our environment and make the time to return unwanted electronics for proper reuse and recycling.

These actions by Canadians, along with governments, electronics manufacturers and retailers are making a positive difference both to our environment and the design of new products.

This year's Design for Environment Report provides an overview of design improvements resulting in decreased use of resources including elimination of many materials of concern, improvements to conserve energy, and reductions in our overall carbon footprint.

THE 1st R: REDUCE

Multi-functionality

E-FACT
Shipments of phablets to Canada will represent up to 20% of the smartphone market in 2014.[6]

With the demand for multi-function products increasing, companies are designing devices with multiple applications. One product can now perform the functions of what once took many devices. One of the most high profile examples is the phablet. This category generally refers to smartphones with screens over 5- inches but smaller than a 10-inch tablet computer. These are devices that function as a smartphone, gaming unit, tablet and PC. [1]

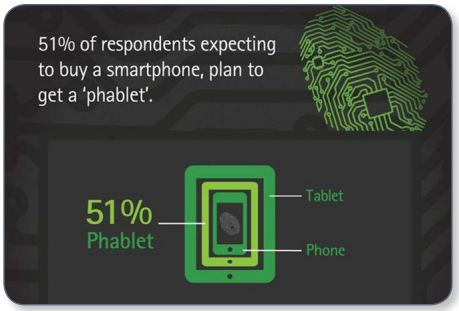


Image 1-1 [2]

SONY The **Sony** Xperia Z Ultra is a device with a large 6.4" display. This versatile phablet, replaces the need for a separate cellphone and tablet. The Xperia Z Ultra is also equipped with a music player and powerful 8 mega pixel camera with a 16x digital zoom and autofocus, features better than many point and shoot cameras on the market. This device has the potential to replace the functions and needs of several consumer electronic products.[3]

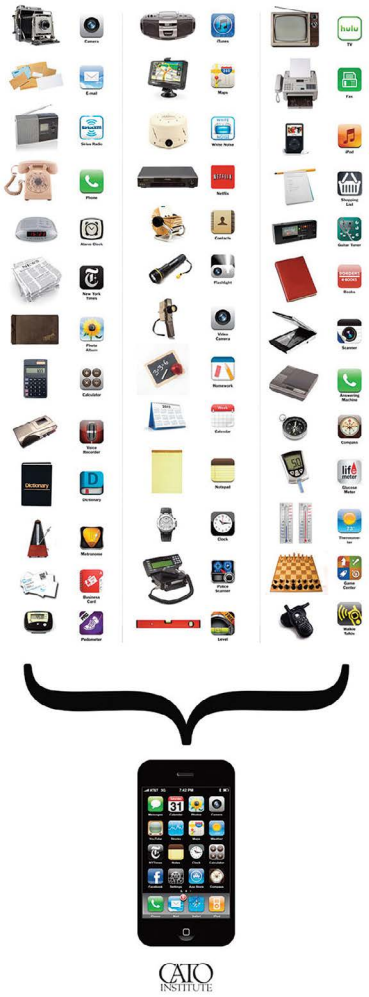


Image 1-2 [7]

Multi-functional devices will soon surpass single function smartphone and tablet sales and now include phablets, convertible devices (two-in-one laptop/tablets), and wearable devices. The move towards multi-functional devices has a positive environmental impact by reducing consumption of resources.

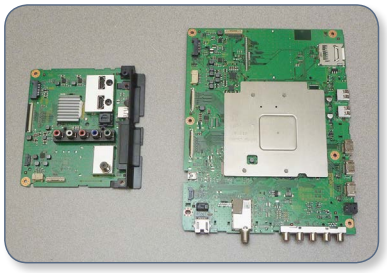
A January 2014 trend report by Global Industry Analysts projected a significant replacement of portable media players by smartphones with built-in media players.[4]

PCs (desktops and laptops) are now competing with popular tablets and other multi-functional products, and market changes are expected to continue.

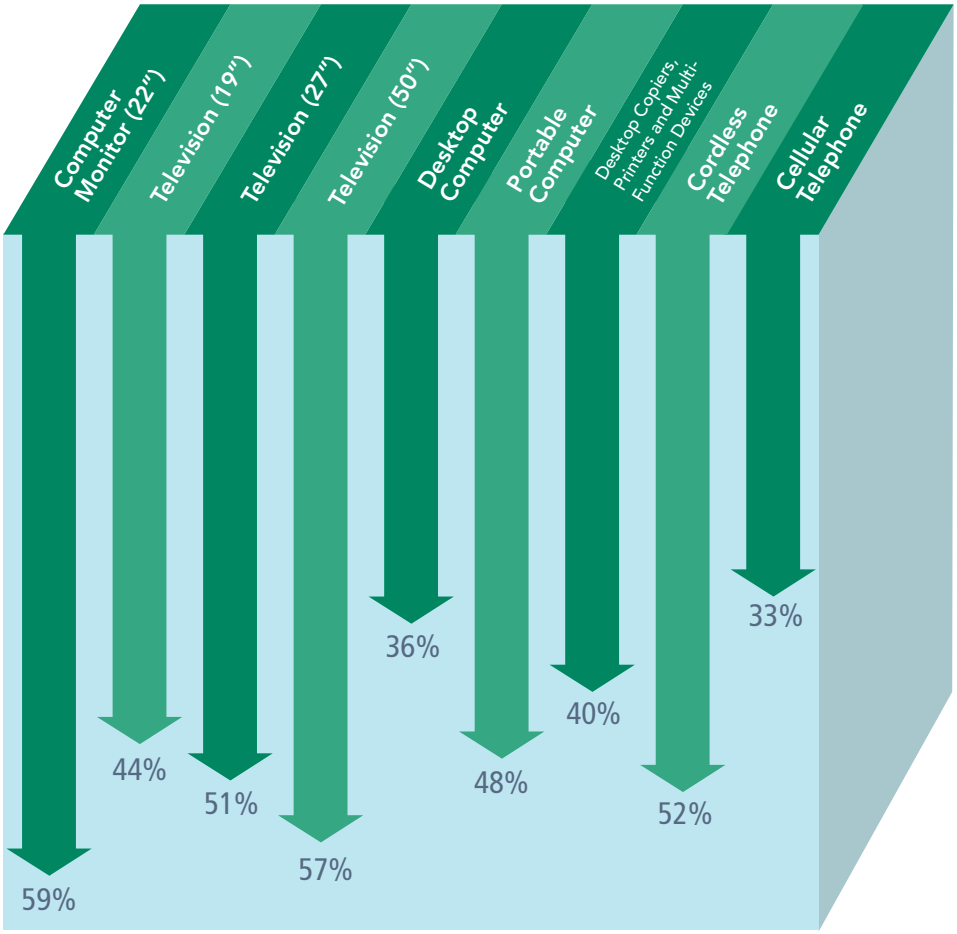
As the desire for even more multi-functional devices grows, phablet shipments are expected to continue to rise significantly.[5] These trends indicate that consumers are demanding single, lightweight devices that can perform many tasks. The result will be a dramatic reduction in electronics weights and volumes entering the waste stream on an annual basis.

THE 1st R: REDUCE

Industry-Wide Weight Reduction by Product Category 2009-2014



LCD TV processing boards; 2014 (left) and 2013 (right). Photo Credit: P. Maddock, Panasonic Canada Inc.



Panasonic Plasma TV Display in 2011

Panasonic Plasma TV Display in 2013

Panasonic's plasma TVs consume on average 50% less power than their predecessor models from 2009. However plasma TVs in turn are being replaced by even more energy and weight efficient LCD (liquid crystal display) and OLED (organic light emitting diode) technologies. LCD TVs have also shown notable reductions in weight, with the 2014 main processing board at 60% lighter than its 2013 equivalent.[8]

Image Credits: P. Maddock, Panasonic Canada Inc.

THE 1st R: REDUCE

Requires Far Less Materials

E-FACT
Working on a computer today can involve your keyboard, mouse, and display connecting automatically to your smartphone, tablet or phablet. Wireless and battery technology are evolving to provide wireless bandwidth and the power required for mobile offices.

Advances in technology have allowed for a dramatic reduction in the weight of electronics and the types of materials used. Not long ago, users needed a server on their desk to power a personal computer. The workings of a computer are so small today that they can be built around the display itself.

The engine of the Personal Computer – the Central Processing Unit (CPU), Graphics Processing Unit (GPU), and Random Access Memory (RAM) are now small enough to be carried around with us in our mobile devices. By reducing the size of the microprocessors contained in our electronic devices, manufacturers are able to produce products that weigh less, generate less heat and increase the size of memory on small devices. [9]

Thin Clients

HP thin client computing devices can require up to 65% less material to produce and ship than HP's smallest desktop PC. Thin clients also have fewer overall parts than traditional PCs and do not contain any moving parts such as fans and disk-based hard drives. This results in the device producing very little heat, therefore reducing cooling demands and failure rates—potentially saving resources by extending their operational lifetimes. Lastly, 98% of the materials used in HP thin clients are recyclable. [10]

Nanotechnology Advancements

IBM scientists have demonstrated a new approach to carbon nanotechnology that opens up the path for commercial fabrication of dramatically smaller, faster and more powerful computer chips. For the first time, more than 10,000 working transistors made of nano-sized tubes of carbon have been precisely placed and tested in a single chip using standard semiconductor processes. These carbon devices are poised to replace and outperform silicon technology, allowing further miniaturization of computing components and leading the way for future microelectronics. [11]

THE 1st R: REDUCE: DO MORE WITH LESS

Product Life Extension

Samsung's "Smart Evolution" technology used in the Samsung Evolution Kit (SEK-100) allows users to constantly upgrade their television's processors and software by plugging in a business card sized evolution kit to the back of the television. Consumers can improve the hardware performance by upgrading CPU, GPU and memory, and enjoy advanced functions and smart contents by software upgrade without having to replace the whole set. This design innovation contributes to extension of the product life cycle by encouraging upgrading of products rather than replacement.

Image Credit: Sony of Canada Ltd.

2 -in- 1 Devices – Fewer Devices, Less Waste

Since around 2012, convertible and detachable laptops, also referred to as 2-in-1s, have gained great popularity with consumers. These versatile PCs aim to provide the functionality of a laptop and a tablet in one device. [13] This is once again an effort on the part of the electronics manufacturers to produce a versatile product that is both convenient and multi-functional.

E-FACT

Globally in 2013, the number of mobile-connected tablets increased just over twofold and each tablet generated over two and a half times more mobile data traffic than the average smartphone. [12]

CLOUD STORAGE & APPS

- Data is now mobile and no longer needs to be stored in physical devices on a desk in the office or at home.
- Storage can be provided by flash memory built into a smartphone or tablet, external storage wireless devices, and cloud storage.
- Instead of being device-focused as electronics were in the past, new design and technology has allowed us to be more data-focused. This shift comes with significant reduction of weight and materials that require recycling.
- For the Industrial, Commercial and Institutional sector, cloud storage has the ability to dramatically reduce the large user's carbon footprint and energy costs when compared to the use of onsite servers due to the lack of IT infrastructure required.

Source: Cloud Computing and Sustainability: The Environmental Benefits of Moving to the Cloud[14]

IBM Cloud on IBM Power Systems can enable businesses to attain:

- 75% reduction in floor space
- 50% reduction in operational expenses
- 80% less time to deploy new customer environments

Source: "Just the Facts Ma'am" IBM Pulse Blog[15]

THE 1st R: REDUCE

Design for Energy Efficiency

Canada's federal government is a significant purchaser of goods and services. When making purchases, the Federal government is guided by its **Policy on Green Procurement (2006)**, which requires federal departments to use "environmentally preferred" goods – a definition that includes energy efficient, **ENERGY STAR** qualified products.[20]

Electronics manufacturers are responding to consumer demand and government standards for energy efficient products. This design decision has been observed particularly in televisions, one of the largest sources of power usage.[16] Today's LCD flat-screen televisions use 63% less energy than ten years ago.[17] Additionally, computer energy efficiency has doubled every 1.57 years – and is expected to continue at this pace for the foreseeable future.[18]

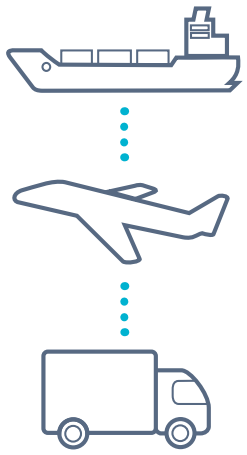
Electronics from computers to home theatre equipment are being designed with energy efficiency in mind, as many producers are designing to meet ***Energy Star*** standards in Canada. Energy Star products save energy without compromising performance in any way. Typically, an ***Energy Star*** qualified product is in the top 15 to 30 percent of its class for energy performance.[19]

Samsung televisions are equipped with eco ambient light sensor technology which adjusts the brightness of backlighting according to the brightness around a product. When the surrounding brightness is high, the product brightness intensifies, and when the surrounding brightness is low, the product brightness dims. The sensor installed in an LED TV saves energy consumption by as much as 53%.[21]

Canon's image RUNNER ADVANCE C5200 Series Imaging Equipment was designed specifically for low carbon dioxide emissions. Calculation of CO2 emission quantities was included in the design process from the outset. The combined CO2 emission amount for power consumption, materials, and logistics for one image RUNNER ADVANCE C5200 Series product is 50% compared to predecessor models.

Toshiba's e-STUDIO 306LP is the first multi-function printer to incorporate a unique erasable toner. Printed output pages can be erased and re-used multiple times. This process can reduce overall carbon dioxide emissions by more than 50% when compared with conventional printing methods.

Innovations in Packaging and Shipping



Electronics producers have made great improvements in packaging design on many fronts including: use of sustainable materials, reductions in volume of material required and safety of products while in transit. Electronics manufacturers are striving to conserve resources by using recycled materials in packaging. Additionally, as electronic products become smaller they require less packaging and a greater volume of units can be shipped in each container resulting in a reduction in overall greenhouse gas emissions.

Apple has reduced iPhone packaging mass by 26 percent from 2007 to 2013, resulting in the ability to pack up to 60 percent more iPhone 5s boxes in each airline shipping container. That saves one 747 flight for every 416,667 units shipped.[22]

Cisco's packaging engineers work with product design teams to reduce protrusions and decrease the fragility of the product as well as its external dimensions as part of the company's "Pack It Green" program. These efforts look to reduce the size of the product for an overall reduction in packaging use. Globally in 2013, this work has resulted in savings of approximately 634 metric tonnes and $7.7 million of packaging material and freight. [23]

DESIGN CHANGES THAT INFLUENCE THE 2ND R: REUSE

Reuse: The provision of functioning electronics to another user, for its intended purpose, without hardware repair or modifications. The reuse activities are limited to non-intrusive operation verification; cleaning; replacement of consumable items such as batteries, toners, fusers, etc.; data and other information clearing; and software installation.

Refurbishment: Any disassembly of electronics for the purpose of internal testing or troubleshooting; or replacement or repair of non-functioning or obsolete parts, not including consumable items such as batteries, toners, fusers, etc.

Source: *OES* [25], EPRA[26]

The electronics reuse and refurbishing industry is a thriving, growing and sustainable business. It is focused on computers of about three years of age and floor standing copiers, printers and multifunctional devices from the commercial sector. Smart phones, tablets and mobile devices of all kinds are also increasingly being refurbished, powering growth in reuse.

There are many successful companies across Canada refurbishing and reselling most brands of consumer electronics, information technology, and telecommunication products and parts. These are the manufacturers themselves as well as sophisticated operations that provide after sales services to electronics companies. These operations refurbish products back to the original manufacturer specifications, which is critical from both a safety and quality perspective.

CISCO

3182 metric tonnes of Cisco products were refurbished, reused or resold globally in 2013. Cisco achieved a 25% reuse rate on returned products in 2013.[24]

Variables That Impact the Reusability or Reparability of Used Electronics

Customer demand	Older technology often no longer has a viable market in Canada but may in overseas markets
Material composition	CRT glass monitors are not reused as they support an old technology. They are all sent for recycling
Leases	Products on lease come back within a viable time period designed for refurbishment and resale. The commercial marketplace, especially leased products, drives refurbishment activity
Source of feedstock	The consumer marketplace does not provide products of consistent quality, brand or condition. It is therefore expensive to manage this source. Consumers tend to sell or gift electronics they no longer want before sending to recycling. In a 2013 study of Canadian cellphone users it was found that 20% of respondents gave away or sold their old cellphone to a friend or family member and 42% still have a device in storage.[27]
Data protection	Being able to effectively wipe data and to replace the operating system with a licensed system is required of commercial re-furbishers, e.g. MAR (Microsoft Authorized Re-furbishers).
Mobility	Mobile devices are highly sought after for refurbishment

THE 2nd R: REUSE

Design for Reparability, Refurbishment and Reuse

Electronics manufacturers are increasingly designing products that are easily reparable, built for life extension and able to be refurbished and upgraded. Many manufacturers and retailers in Canada offer take back programs whereby used electronics products are accepted from their customers and are then refurbished and resold if possible or recycled.

In the IC&I sector, many electronics are leased by the manufacturer to businesses which enables manufacturers to recover usable components, refurbish devices to as-new condition, and sell or lease the refurbished product often with the same warranty as a new product but for a lower price.[29]

To aid in extending product life and safe disassembly companies now provide step-by-step instruction guides required to identify materials and components for disassembly.

Maintaining and repairing devices dramatically improves their usable lifespan. Access to disassembly manuals creates options for refurbishers to facilitate the removal and replacement of components.

Refurbished cell phones and computers can be resold to consumers that may not otherwise be able to afford new devices.

This growing sector is also a source of new, sustainable local jobs. Increasing focus on repair and reuse is a key element in moving towards sustainable consumption in production models.

Design for Disassembly

Electronics products designed for ease of disassembly at the end of their usable life include the following design considerations:

- access to disassembly manuals
- easy disassembly (by hand or using common household tools)
- uniform and less number of screws
- provide easy access to screws
- batteries user removable
- eliminating the use of glues and adhesives
- use of snaps and clips[30]
- use of modular components
- use of materials that manufacturers want back
- use of recycled materials
- ease of material liberation through the use of uniform materials[31]

Dell's *Latitude 10* tablet has received excellent reviews by iFixit (Feb 2013) and the Fraunhofer Institute (Aug 2013) for the product's ease of disassembly for repair or recycling. Design features which aid in the product's easy disassembly include: ease of opening the device via clips, minimal hardware used to secure the internal battery and the battery slips easy into the connector.[32]

HP Desktop PCs, Notebook PCs use common fasteners and snap-in features to avoid applying glues and adhesive welds making them easier to dismantle, separate, and identify different plastics.[33]

The Secret Second Life of Electronics

Component Parts

In the book Junkyard Planet, author Adam Minter explains that cellphones up to six years old, contain computer chips that are being purchased by companies manufacturing scrolling digital signs. This is a downgrade from running spreadsheets, web browsers or games but it is better than digging up new gold, copper and silicon for a new chip. A re-useable chip can run a sign for 15 years. That is better than shredding and recycling the chip. Old cellphones can be purchased for as little as a few pennies to reflect their metal content, but if the chip in the phone is resold to a sign manufacturer for $10, then reuse becomes a profitable business.[28]

Dell Latitude 10 Tablet
Image Credit: Froundhofer IZM

THE 3rd R: RECYCLE

Design for Material Recovery

Electronics products are valuable resources at the end of their first life. Over 40% of the worlds' mining production of copper, tin, antimony, indium, ruthenium, and rare earth metals go into electronic products.[34] Mobile phones and computers account for over 4% of the world's production of gold and silver and for 20% of palladium and cobalt. Yet a United Nations Environment Programme (UNEP) report found the recycling rate of precious metals in electronics is remarkably low, (below 15%)[35], reflecting low collection rates in many parts of the world but also limitations in recovering all these valuable materials. This is one of the many reasons for ensuring that end-of-life electronics are diverted from landfills, so that these valuable materials can be recovered, recycled and reused.

E-FACT

One metric tonne of circuit boards can contain 40 to 800 times the amount of gold and 30 to 40 times the amount of copper mined from one metric tonne of ore in the US. [39]

Design with Recycled Materials

The use of secondary feedstock in place of virgin materials avoids many of the activities and environmental impacts associated with primary resource extraction. Avoiding these upstream activities (e.g. mining, smelting, transporting, etc.) significantly reduces energy usage and greenhouse gas (GHG) emissions.

SONY **Sony** Recycled Plastic (SoRPlas) is made from up to 99% recycled material— and the one percent remainder includes Sony's original flame retardant that provides superior flame resistance while eliminating the need for brominated flame retardants (BFRs). SoRPlas can be recycled repeatedly while retaining its original characteristics better than virgin PC plastic does. It also holds colour well, which eliminates the need for coating or painting.[36]

lenovo 100% of **Lenovo** products released after March 31, 2013, contain at least 5% post-consumer recycled content relative to total plastics weight. From January 2012 to June 2012 Lenovo used over 45,360 metric tonnes (gross) of recycled plastics in the manufacturing of their consumer electronics products.[37]

Panasonic **Recycling of Cathode Ray Tube (CRT) Glass |** Glass makes up about 60% of the total weight of CRT TVs. Until recently, the part of the recycled CRT of TVs was reused to create new CRT TVs. However, with the rapid shift to flat-panel TVs and the end of analog broadcasting, production of CRT TVs has ended. **Panasonic** has developed a proprietary reprocessing technology that converts glass from used CRT TVs into glass wool fibers to make the vacuum insulation materials for refrigerators.[38]

THE 3rd R: RECYCLE

Design for Material Recovery

E-FACT
Recycling 1 million cellphones can recover up to 34 kilograms of gold, 15 kilograms of palladium, 350 kilograms of silver and 15,875 kilograms of copper. [43]

Canadians are recycling-oriented and want to pass on a rich natural environment to the next generation. Waste Electrical and Electronic Equipment recycling programs (WEEE) in Canada are instrumental in facilitating the shift towards a closed loop system, with more and more manufactures creating products with components that are designed to be recycled or refurbished.

Image credit: Dell Corporate Communications

Creating a Closed-Loop System | Dell's new closed-loop supply chain developed in partnership with Wistron GreenTech will turn plastics from recycled electronics back into new systems, helping drive a circular economy for IT. Dell is the first company in the IT industry to use UL-Environment certified closed-loop recycled plastic in a computer with the launch of the Dell OptiPlex 3030 All-in-One desktop. By reusing plastics already in circulation, Dell is cutting down on WEEE, saving resources and reducing carbon emissions by 11% compared with virgin plastics.[40]

Dell has a goal to use 50 million pounds of post-consumer recycled content plastics in its products by 2020.[41]

Making Products Easy to Recycle | Lenovo products are designed to avoid contamination of plastics by paints, glues or welded connections. Instead of painting product components **Lenovo** uses molded decoration technolog to generate a pattern layer on molded plastic parts. This process eases recycling at the end of life. Paint and coatings, if not removed, can cause chemical degradation of plastics during reprocessing.[42]

E-FACT
In 2013, Provincial electronics recycling programs successfully diverted 5.16kg/capita of WEEE from landfills.

PUBLIC POLICY FOR THE ENVIRONMENT

Landfill Disposal Bans

$8,655,324
Projected annual cost to landfill available WEEE in Canada[46]

VS

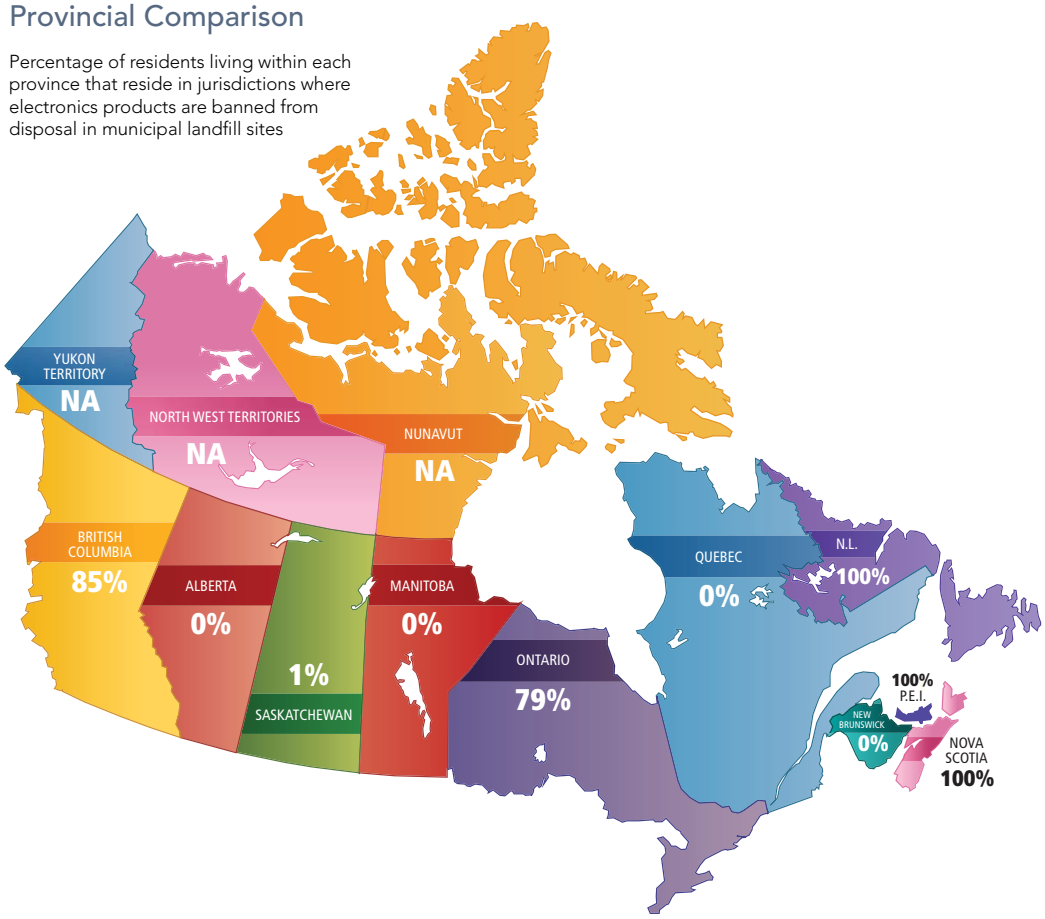
$140,190,485
Actual cost to responsibly recycle the same WEEE[47]

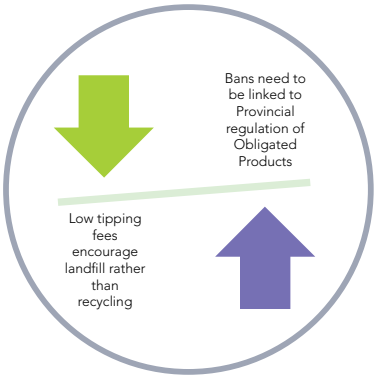
Outcome: It is cheaper to landfill waste than recycle, hence the need for province-wide disposal bans.

One of the most effective measures supporting recycling is a disposal/landfill ban because it effectively closes the door to disposal as an option.[44] Nova Scotia, PEI and Newfoundland currently uphold province-wide landfill bans for electronics. In other provinces across Canada where such wide reaching bans are not in place, individual municipalities have passed bylaws to ban and divert end of life electronics from landfills. The graphic below illustrates the extent to which electronics products are banned from disposal in municipal landfill sites across the country.

Provincial Comparison

Percentage of residents living within each province that reside in jurisdictions where electronics products are banned from disposal in municipal landfill sites





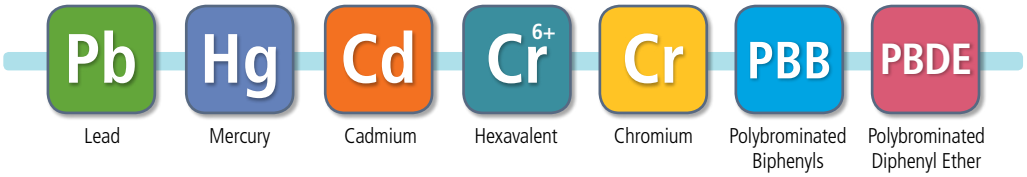
- When electronic products are sent to landfills, the commodity value at the end of life is lost. In 2012, it was reported that 290 metric tonnes of gold and more than 6,800 metric tonnes of silver are now used annually to make PCs, cellphones, tablet computers and other new electronic and electrical products worldwide. At the end of life this resource will be worth more than $21 billion in value each year through the process of "urban mining".[45]
- Diverting this material from landfill can result in significant cost savings to the municipality and save valuable landfill space.

KEY DRIVERS FOR DESIGN CHANGE: MATERIALS OF CONCERN

European Union Restriction of Hazardous Substances (RoHS) Directive

This Directive restricts the use of six hazardous materials in electronics: Lead, Mercury, Cadmium, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ether (PBDE).

Because electronics are manufactured for a global market, the RoHS Directive has been a significant driver for reducing and eliminating environmentally sensitive materials in electronic products sold in Canada. Additionally, many electronics manufacturers have voluntarily chosen to eliminate the use of potentially hazardous substances not included in the RoHS Directive.



Alternate Materials Use

Industry leaders voluntarily strive to develop the best sustainable alternatives for the environment as soon as viable, cost-effective solutions are available.[48] The use of potentially hazardous substances is in decline in Canada through voluntary manufacturer phase outs as alternatives become available.

Examples of substances being voluntarily phased out by electronics producers include:

- Shift from the manufacture and sale of CRT, plasma and LCD displays to LED displays eliminates or significantly reduces the use of Lead, Mercury and Arsenic.
- Polyvinyl Chloride (PVC) and brominated flame retardants (BRFs), a group of chemical flame retardants that are mixed into plastics to slow the ignition and spread of fire, are being phased out when possible through the use of inherently flame resistant materials, such as metal, glass, pre-ceramic polymers, Kevlar, leather, and bioplastics.

Canon uses plant derived bio-based plastics in the manufacturing of certain exterior parts in a number of the brand's multi-function office systems. Compared with conventional petroleum-based plastic, this new material offers an expected reduction in manufacturing-related CO2 emissions of approximately 20%.[49]

Apple has replaced components previously containing PVC with nonchlorinated and nonbrominated thermoplastic elastomers in all power cords and headphone cables. Additionally, Instead of brominated flame retardants, **Apple** uses metal hydroxides and phosphorus compounds in circuit boards, cases, and enclosures.[50]

EPEAT ™ (ELECTRONIC PRODUCT ENVIRONMENTAL ASSESSMENT TOOL)

E-FACT

Currently, EPEAT applies to desktop computers, notebooks, workstations, thin clients, monitors, printers, copiers, scanners, multifunction devices, fax machines, digital duplicators, mailing machines, and televisions.

3000+ different electronics products are currently EPEAT registered in Canada

EPEAT is a procurement tool to help institutional purchasers in the public and private sectors evaluate, compare and select electronics products based on their environmental attributes. The EPEAT rating system was developed and is managed through an open process involving representatives from all stakeholder groups. Manufacturing, environmental advocacy, academic, trade association, government and recycling entities all actively participate. EPEAT promotes improvements in product sustainability and energy use. EPEAT's rating system enables consumers to view and compare the environmental performance of electronic products throughout their life cycle. EPEAT's three current categories (PCs and PC Displays, Imaging Equipment, and Televisions) are based on the **IEEE 1680** family of Environmental Assessment Standards.[51]

Product Evaluation Criteria Used by EPEAT[52]

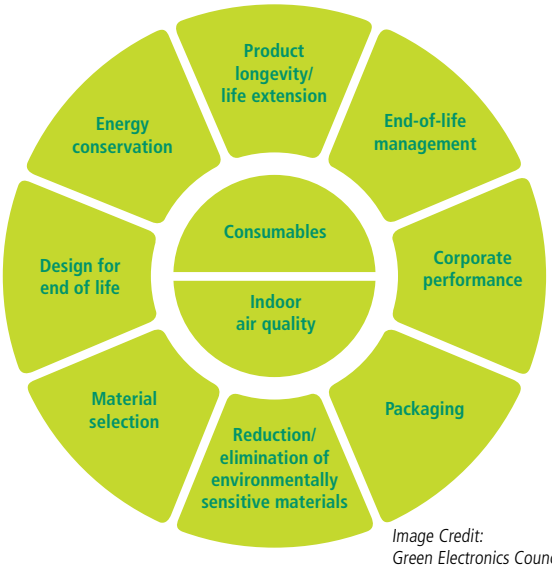


Image Credit: Green Electronics Council 2013

Green (< 50%)

Greener (50-75%)

Greenest (>75%)

EPEAT Products Rating Scale

Products are measured against both required and optional criteria. A product must meet all of the required criteria in its category to be added to the registry. It is then rated Bronze, Silver or Gold depending on how many of the optional criteria it meets. Bronze-rated products meet all required criteria, Silver-rated products meet all required criteria and at least 50% of the optional criteria, and Gold-rated products meet all required criteria and at least 75% of the optional criteria.[53]

TOSHIBA ***All Toshiba laptops and desktop computers qualify as EPEAT Gold; and 21 of the company's Multi-Function Printers qualify as EPEAT Bronze.***

ENDNOTES

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ABOUT EPSC

Electronics Product Stewardship Canada (EPSC) is a not-for-profit, industry-led organization working to represent the interests of electronics manufacturers for innovation in enhanced end-of-life solutions for electronic products in Canada.

Our EPSC members have shown environmental leadership by working with stakeholders to create effective environmental stewardship programs across Canada, by investing in design improvements to their products and processes, and by establishing an innovative standard for the responsible handling of end-of-life electronics.

Responsible electronics manufacturers are members of EPSC:

- Apple Canada Inc.
- Asus
- BenQ Canada Corp.
- Brother International Corporation (Canada) Ltd.
- Canon Canada Inc.
- Ciaratech
- Cisco Systems Inc.
- Dell Canada Inc.
- Electro-Federation Canada
- EMC Corporation
- Epson of America Inc.
- Fujitsu Canada Inc.
- Hewlett-Packard (Canada) Co.
- Hitachi Data Systems Inc.
- IBM Canada Ltd.
- Information Technology Association of Canada
- LG Electronics Inc.
- Lenovo
- Lexmark Canada Inc.
- Microsoft Corporation
- NetApp Inc.
- Northern Micro Inc.
- Oracle Inc.
- Panasonic Canada Inc.
- MMD-Philips
- Samsung Electronics Canada Inc.
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