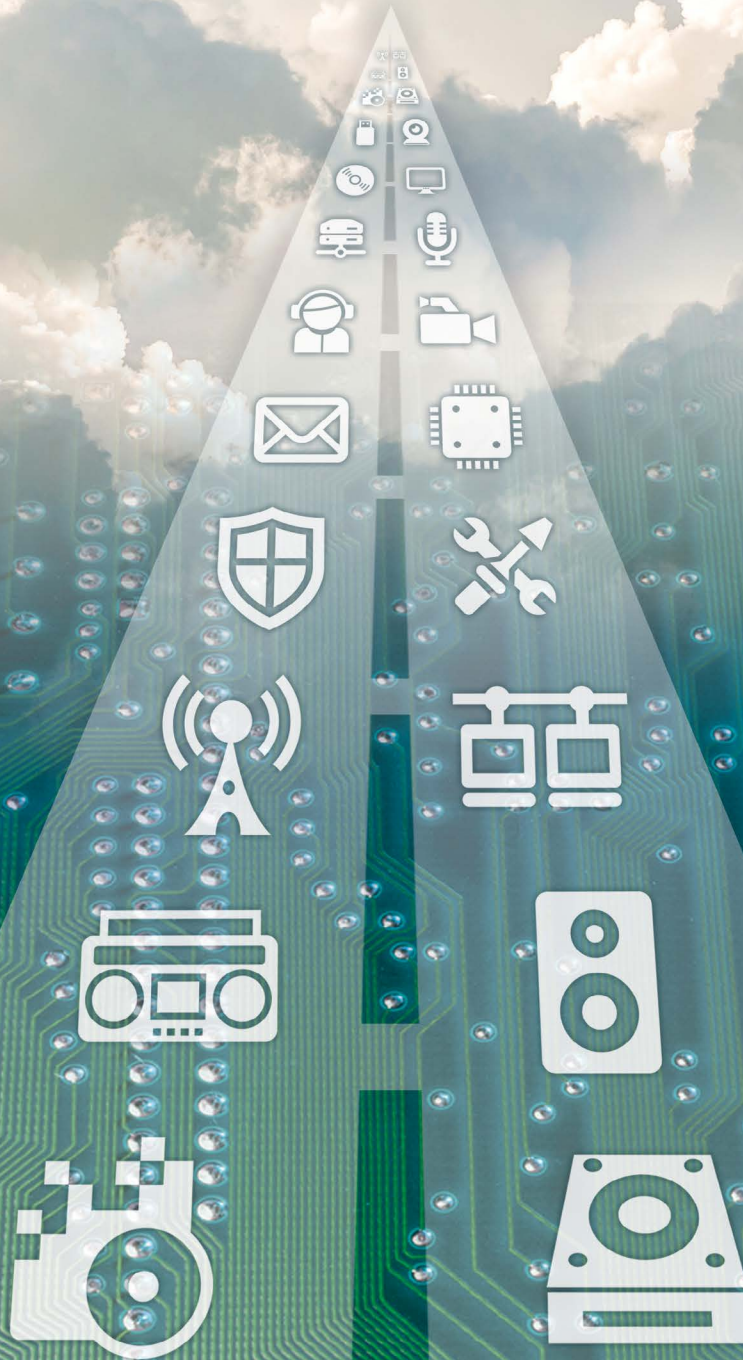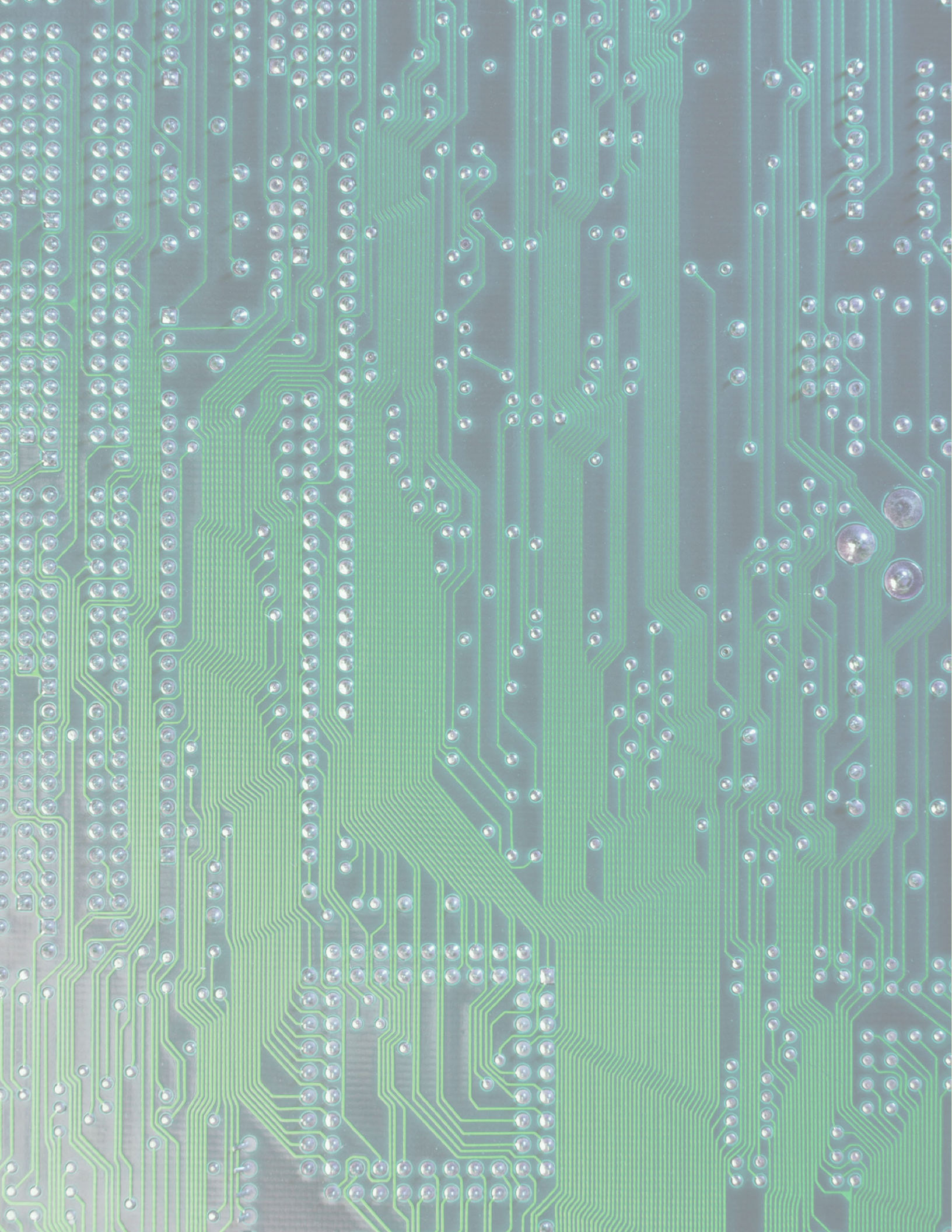# 2019 DESIGN for ENVIRONMENT REPORT

Message from Electronics Product Stewardship Canada, (EPSC)

EPSC is proud to be releasing our 11th Design for Environment Report.

Since our first Report in 2009, electronics manufacturers have made significant progress designing more energy efficient products, reducing the use of chemicals of concern in products, increasing reuse and recycling options available for end-of-life electronics, and have significantly reduced carbon emissions.

The estimated number of "internet of things" connected devices used by consumers in North America, including sensors, personal computers, and phones, and displays is about 11 per person.[1] Although the number of devices has increased, at the same time the material footprint has shrunk dramatically.

Our report this year looks more closely at the balance of resource usage in making products, improvements in energy efficiency, and how our sector is dealing with societal concerns about the management of plastics at the end of a product's life.

We continue to evolve our products for the benefit of consumers and our Canadian natural environment.

Jeff Van Damme

Chair of the Board
EPSC
(Samsung Electronics
Canada Inc.)

Shelagh Kerr

President and CEO
EPSC

Energy Efficiency

Innovation and competition are making consumer electronics more energy efficient than ever before. Whether in product design or through use of data centres, energy efficient products save consumers money and reduce greenhouse gas emissions.

Policymakers are defining energy efficiency standards for consumer electronics. Regulated products include televisions, laptops, battery chargers, and external power supplies.

EPSC members comply with energy efficiency standards and regulations in Canada, including:

- Federal – Energy Efficiency Regulations, 2016 (Energy Efficiency Act, 1992)
- Ontario – Energy and Water Efficiency Regulation 509/18 (Electricity Act, 1998)
- Quebec – Regulation Respecting the Energy Efficiency of Electrical or Hydrocarbon-Fuelled Appliances (Act Respecting Energy Efficiency and Energy Conservation Standards for Certain   Electrical or Hydrocarbon-Fuelled Appliances, 2011)
- British Columbia – Energy Efficiency Standards Regulation (Energy Efficiency Act, 1996)

EPSC members are also recognized for their voluntary efforts to improve energy efficiency. **ENERGY STAR Canada** - certified products meet strict technical specifications for energy performance. Typically, an ENERGY STAR-certified product is in the top 15-30 percent of its class for energy performance.

Samsung Electronics Canada receiving the 2018 ENERGY STAR Manufacturer of the Year Award

- **Samsung Electronics Canada** was awarded the 2018 ENERGY STAR Manufacturer of the Year Award for the fourth consecutive year. The award recognizes excellence in offering Canadian consumers the most energy-efficient electronics available on the market.[2]

- ENERGY STAR's Most Efficient Computer Monitors for 2018 include those manufactured by **Asus, BenQ, Dell, Fujitsu, HP, LG, Lenovo**.[3]

- **Dell Canada** was the first manufacturer in Canada to have ENERGY STAR-certified enterprise servers, data center storage and large network equipment – 152 products in total.[4] Since 2012, Dell has reduced their product portfolio's energy intensity by 60 percent.[5]

Dell server

TCL *Roku TV: 6-Series*

Energy used by televisions has declined due to the shift from CRT to LCD displays. Despite increasing screen sizes and improved resolutions, TV energy usage continues to steadily decline as newer, more efficient displays replace older models.

Newer television models have power-management settings that enable them to operate more efficiently. For example, **TCL**'s Roku TV can be set to automatically shut off following a period of inactivity. The Auto power savings feature provides additional options to save power.[6]

Overall, electronic products continue to consume less energy. Research from the Consumer Technology Association shows that the per unit energy consumption of televisions, set top boxes, gaming consoles, and portable computers has been steadily decreasing.
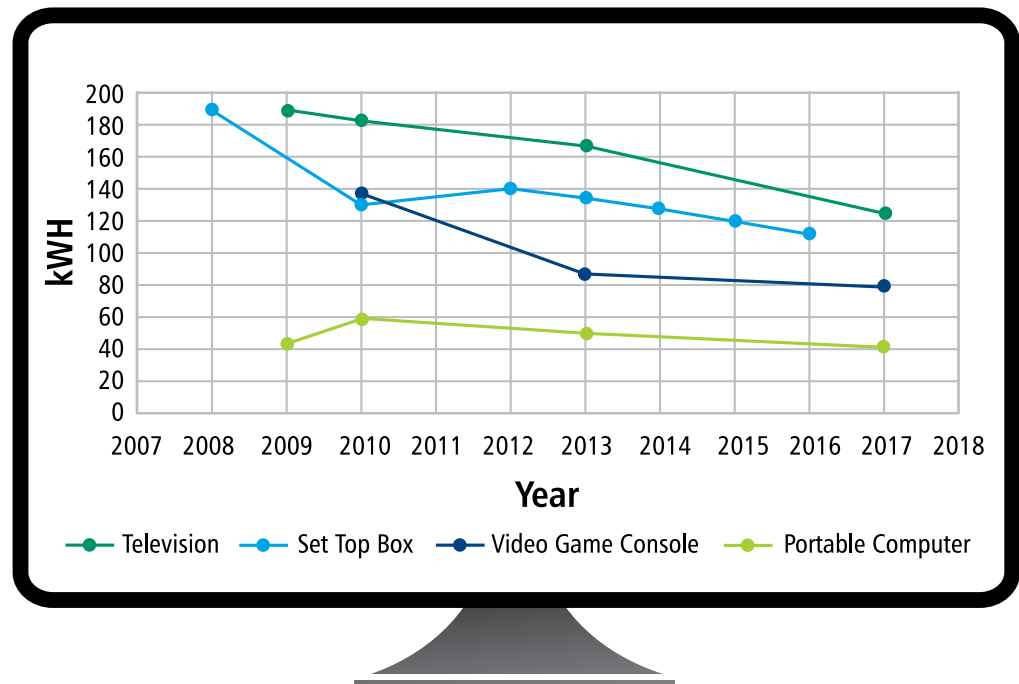

Figure 1: Unit Energy Consumption of Electronic Devices (Consumer Technology Association, 2017)

The decrease in energy used by video game consoles is a result of the decline in installed consoles, and changes in power draw characteristics. Set-top boxes draw less energy as a result of new technology that enables consumers to use a single DVR unit to serve multiple thin clients in the home.[7]

SONY

In 2017, Sony's annual energy consumption per product was 50 percent lower than in 2013.

Since setting the target of reducing annual energy consumption per product[I] from product use, **Sony** has made great progress in reducing the power consumption of flat screen televisions and game consoles. Total CO_2 emissions in product use over the lifetime of all products sold in 2017 were 3.8 percent lower than in 2016, mainly due to the decreased energy consumption of game consoles.[8] [II]

I   Energy-using products which operate the intended main function with energy input from a commercial power supply.

II   Given the difficulty of determining how many previously sold Sony products are still in use by consumers of the total number of Sony products sold to date, Sony uses the total quantity of electrical power consumed while in use over the lifetime of Sony products sold in the current fiscal year as an indicator for CO_2 emissions during use.

Lowering Our Carbon Footprint

Reducing greenhouse gas (GHG) emissions is a high priority for Canadians. As a signatory to the United Nations Paris Agreement, Canada has committed to reducing GHG emissions by 30 percent from 2005 levels by 2030. Electronics manufacturers are already helping Canada meet these goals by demonstrating leadership in reducing their carbon footprint through innovative products and new initiatives.

In 2012, **Microsoft** pledged to make their operations carbon neutral: to achieve net zero emissions for their data centers, software development labs, offices, and business air travel by using technology to increase efficiency and by investing in internal efficiency initiatives and green power, as well as carbon offset projects for unavoidable carbon emissions.
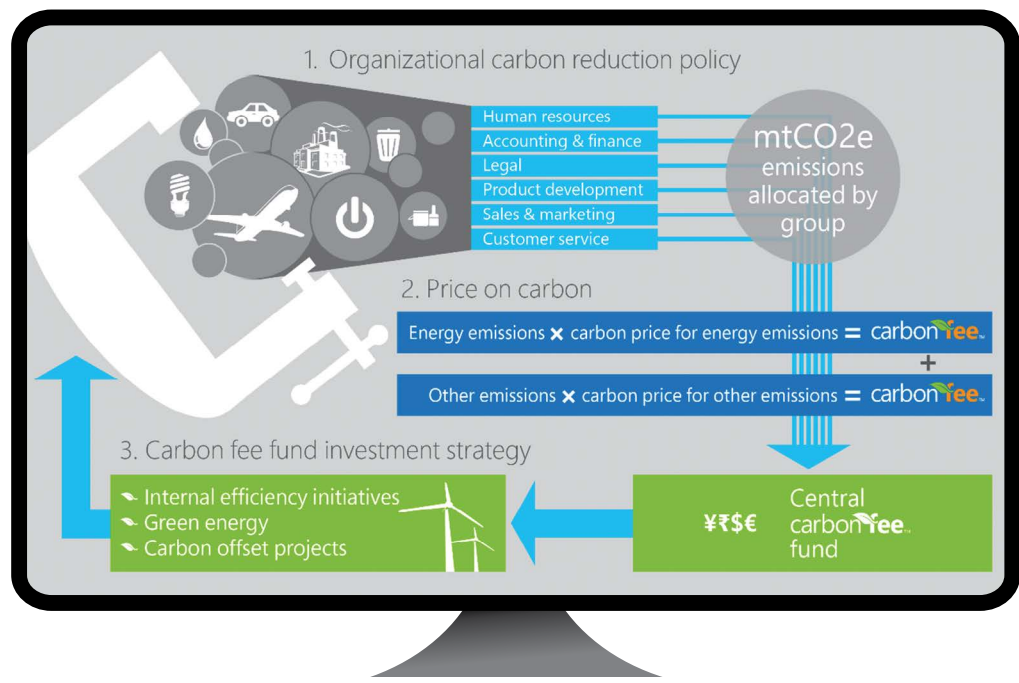

Figure 2: Microsoft carbon fee model

Since 2012, Microsoft has reduced emissions by more than 9 million metric tons of carbon dioxide equivalent (mtCO2e).[11]

As part of their pledge, Microsoft set an annual internal carbon price to reduce and offset their carbon emissions. Microsoft has implemented a carbon fee model that puts an incremental fee on the carbon emissions associated with the company's operations. By taking steps to internalize the external cost of carbon pollution and making the cost of carbon emissions felt across the organization, Microsoft is realizing direct operational benefits while contributing to a global transition to a low-carbon economy.[9] The tax produces about $30 million a year that goes into a common fund that Microsoft uses to spend on energy improvements.[10]

Dell is working with Indian startup, Chakr Innovations, to capture the exhaust from diesel generators and refine the soot into carbon black, using it in ink used to print on packaging. Their device captures approximately 90 percent of the particulate matter from the generator it is attached to. Clean air is released through the other side and the soot can be used to make black ink. Dell is the first company to use this pollution ink at a large scale and has plans to expand its use globally.[12]

Dell packaging printed using pollution ink.

In 2017, **IBM** contracted with its utility suppliers to purchase approximately 779,000 MWh of renewable electricity, representing 22.9 percent of their global electricity consumption at IBM-managed locations. IBM avoided 275,000 MT of CO_2 emissions through these contracted purchases.[13]

GHG Emissions Science-Based Reduction Targets

Many electronic manufacturers have established "science-based" targets to reduce GHG emissions. These targets are in line with the level of decarbonization required to keep global temperature increase below 2 degrees Celsius compared to pre-industrial temperatures, as described in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Science-based targets are verified against the latest SBTi criteria.[14]

Company	GHG Reduction Commitments
Brother	• Reduce absolute scope 1 and 2 GHG emissions 30% by 2030 from a 2015 base-year. • Reduce absolute scope 3 GHG emissions from purchased goods and services, use of sold products and end-of-life treatment of sold products 30% by 2030 from a 2015 base-year.
Cisco	• Reduce absolute scope 1 and 2 GHG emissions 60% by 2022 from a 2007 base-year. • Improve system power efficiency from 77 to 87% by 2022 for large, rack-mounted equipment.
Dell	• Reduce scope 1 and 2 emissions 40% by 2020 from a 2010 base-year. • Reduce the energy intensity of their product portfolio 80% by 2020 from a 2011 base-year.
Epson	• Reduce absolute scope 1 and 2 GHG emissions 19% by 2025 from a 2017 base-year. • Reduce scope 3 emissions from purchased goods/services and use of sold products per unit of value added 44% by 2025 from a 2017 base-year.
Fujitsu	• Reduce absolute scope 1 and 2 GHG emissions 33% by 2030 and 80% by 2050 from a 2013 base-year. • Reduce scope 3 GHG emissions 30% by 2030 from a 2013 base-year, for purchased goods and services and the use of sold products.
HP	• Reduce scope 1 and 2 GHG emissions 25% by 2025 from a 2015 base-year. • Reduce scope 3 emissions intensity from the use of its products 25% by 2020 from a 2010 base year. • Reduce scope 3 emissions intensity from first-tier production and product transportation suppliers 10% by 2025 from a 2015 base-year.
Hewlett Packard Enterprise	• Reduce scope 1 and 2 GHG emissions 25% by 2025 from a 2015 base-year. • Increase energy performance of its product portfolio 30x within the same time-frame, which equates to reducing GHG emissions per operation by over 95%.
Panasonic	• Reduce scope 1 and 2 GHG emissions 30% by 2030, from a 2013 base-year, and to zero by 2050. • Reduce scope 3 GHG emissions from the use of sold products 30% by 2030 from a 2013 base-year.
Ricoh	• Reduce absolute scope 1 and 2 greenhouse gas emissions 30% by 2030 from a 2015 base-year. • Reduce scope 3 GHG emissions from purchased goods/services, transportation, and product use emissions 15% by 2030 from a 2015 base-year.
Sony	• Reduce GHG emissions from operations by 42% below 2000 levels by 2020. • Reduce environmental footprint to zero by 2050, requiring a 90% reduction in GHG emissions over 2008 levels by 2050 (scopes 1, 2, and 3).

Cloud Computing

Cloud computing is lowering energy use by consolidating in-house data servers on to the cloud. Through improvements in equipment and datacenter infrastructure efficiency, cloud services have proven to be up to 93 percent more energy efficient and up to 98 percent more carbon efficient than traditional enterprise datacenters.[15]

Compared to individual hardware, cloud services enable more efficient use of resources by optimizing storage space and computing power. This rapid shift in data center activity from small room or closet data centers to larger data centers is referred to as the "hyperscale shift." Research from the U.S. Department of Energy's Lawrence Berkeley National Laboratory suggests that this shift, along with ongoing best practices in energy efficiency operation, could reduce energy demand in the U.S. by 45 percent from 2014 to 2020.[16] Canada should see a similar reduction.

Cloud computing reduces material use and can extend the life of electronic products. As the functions of traditional consumer hardware are dematerialized and transferred to the cloud, so does the need to replace aging hardware. Since the cloud emphasizes data rather than hardware, it could encourage more consumers to consider purchasing refurbished devices.[17]

Map shows number of data centres in Canada[18]

3Rs: Reduce, Reuse, Recycle

Reduce

Reducing Chemicals of Concern

Electronics manufacturers are actively reducing and removing substances of concern from products to comply with Canadian and international chemicals management regulations. At the same time, they are also ensuring proper recycling and management of substances in end-of-life electronics.

Sony continues to work to eliminate specific phthalates which are used as plasticizers in PVC. These specific phthalates include DEHP, DBP, BBP, DIDP, DNOP and DINP.[19]

Apple has developed a Chemical Prioritization Protocol, a multi-criteria decision aid, to support the identification of chemicals that may be problematic. This decision aid assists in the design of products.[20]

Case Study: Mercury

Companies are also taking initiative in reducing chemicals of concern in products such as lamps for projectors. To replace mercury, **Panasonic** is developing products that adopt laser light sources. The PT-RZ31K Series are projectors for professional use that provide high luminosity by employing a high-output semiconductor laser light source module and a heat-resistant phosphor wheel. In addition, the casing material does not use halogenated flame retardants, making the projector an eco-conscious product that contributes to reducing the use of hazardous substances.[21]

Panasonic PTRZ31K Series Projector

Reducing Product Weight, Increasing Functionality

Electronic products are becoming lighter, while continuing to demonstrate higher levels of performance. For example, **Lenovo**'s new Yoga S940 Laptop features up to 17 hours of battery life and weighs only 1.2 kg, making it one of the lightest laptops in the consumer market. In less than ten years, the Yoga S940 is already 60 percent lighter than older laptop models with similar specifications, as shown below.

2009 Lenovo 15.4" IdeaPad Y530	2019 Lenovo 13.9" Yoga S940
Weight: 3 kg [22]	**Weight: 1.2 kg** [23]

Samsung is also innovative in television design and functionality. In 2017, Samsung released The Frame, a Premium 4K UHD Television that, when turned off, enters Art Mode showcasing art or photos. The Frame comes with a collection of 100 works of art, and is 37 percent lighter than older television models. [24]

In 2019, **Panasonic** developed and introduced its "EXSMALL" prototype in Japan, which provides a wide range of connected services within a very compact living environment. [25]

Panasonic "EXSMALL" prototype.

EPEAT

EPEAT is the leading ecolabel for the IT sector, used by public and private sector purchasers globally. EPEAT-registered products meet strict sustainability criteria that address impacts across the full lifecycle of a product. The number of EPEAT certified products in Canada continues to increase over the years, with almost 2,000 certified electronic products in Canada in 2019.
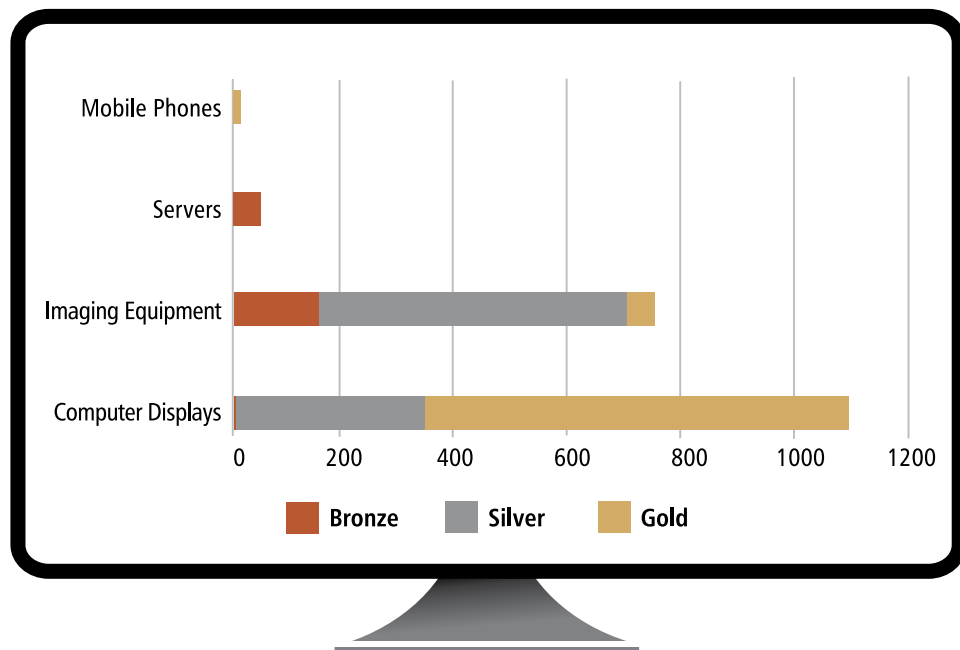
Figure 3: EPEAT Certified Electronics in Canada, 2019

Government of Canada

The Government of Canada includes EPEAT requirements in their purchasing specifications.

Over their lifetime, the 208,780 EPEAT-registered electronics purchased by Shared Services Canada in 2018 will result in the following environmental impact reductions:

- Reduce use of materials by 13,710 metric tons
- Electricity savings of 68,508 MWh
- Reduction of 32,710 metric tons of CO_2 equivalents [26]

Reuse

Reusing Recycled Materials in Manufacturing

Panasonic

Panasonic has used 64,900 tonnes of recycled resin since 2015.

- In 2017, **Sony** used some 18,000 tonnes of recycled plastic[III] in its products. This amount consisted of approximately 66 percent recycled plastic content from scraps and other waste materials generated from manufacturing by the Sony Group and other companies, and approximately 34 percent post-consumer recycled plastic content from used products, containers, and other sources.
- **Panasonic** has developed a high precision resin-sorting system for plastics. Near infrared rays identify the individual types of plastic to separate them out into highly pure fractions, and then to recover each type.
- In 2018, **Cisco** produced 2.6 million IP phones with 35 percent recycled content plastic, avoiding the use of over 437 metric tonnes of virgin plastic. Additionally, Cisco uses 10-15 percent regrind in Cisco-designed parts such as enclosures.[27]

Cisco IP Phone 7800 Series (Left), Cisco 8800 Series IP Phones (Right)

Refurbishment

The environmental impact of electronic products can be significantly reduced through product lifetime extension and reuse.

Refurbishment programs extend the life of electronic products, bringing new economic value to used goods. The refurbishment of electronic products is also a growing market.

In 2017, **Apple** expanded its Apple GiveBack product trade-in program in Canada to include used Macs and PCs. Interested parties are required to answer various questions about the computer being resold and are then provided with an estimated value. The computer is then shipped to Apple for further assessment. Accepted devices are refurbished for resale or recycled responsibly.[29]

According to the International Data Corporation, the North American market for used smartphones is expected to grow 29 percent by 2020.[28]

III Consumption of recycled plastic is based on the gross value including virgin plastic and additives that are mixed with recycled materials.

The **Cisco** Technology Migration Program and Exceptional Pick-Up Program enable customers to return used equipment. These programs provide the newest and best-quality used equipment for refurbishment and reuse. In 2017, Cisco reused over US $249 million of Cisco equipment.[30]

Cisco also uses an Advanced Replacement model to deliver service replacement inventory to customers globally. When a customer experiences a service issue that cannot be solved remotely, they will receive a compatible replacement unit, typically within 24 hours.[31] Cisco's Refresh program then enables consumers to purchase fully licensed Certified Remanufactured Cisco products. Remanufactured equipment is sold to government and industry through Cisco's network of partners, with over 2000 locations across Canada.[32]

Cisco's Refresh

Cisco Services
Return/Recovery

Cisco Global
Scrap Program

Refurbish for
resale

Repair Site

Initial
Product
Use

Customers

Recycling*

Component
Recovery

Resale to Customers
via Cisco Refresh**

Materials
manufacturer

Parts manufacturer

Product manufacturer

Inventory Depot

* Value is created from over 99% of the materials collected in Cisco's GSP. Less than 1% goes to landfill.
**In addition to Services Repair, Cisco utilizes product and lease-return programs. The Refresh program, part of Cisco Remarketing, resells refurbished products.
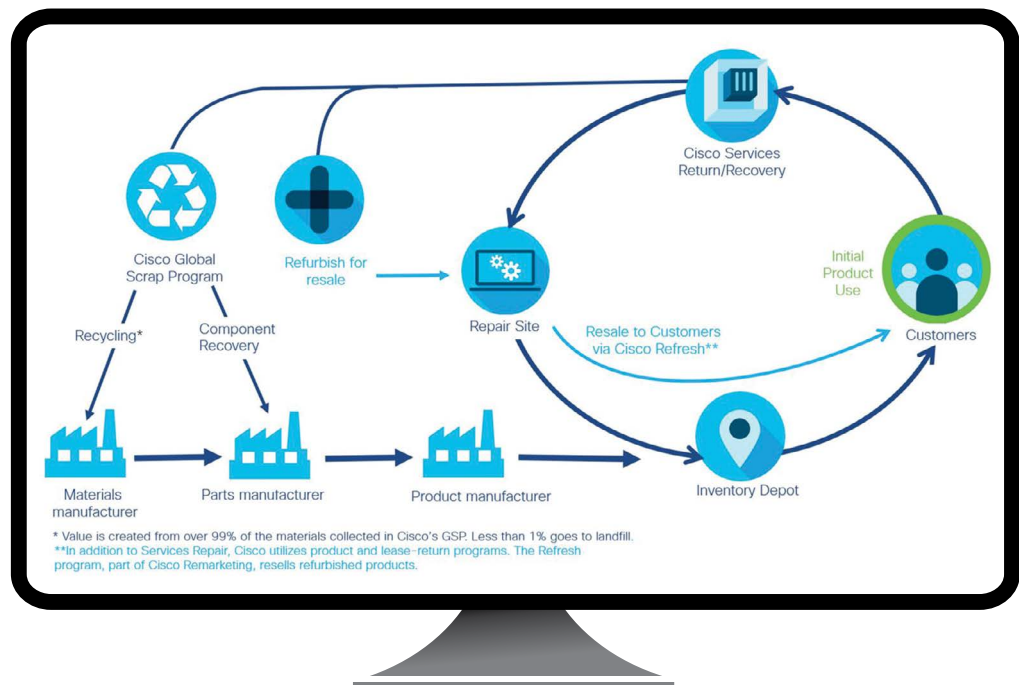
Figure 4: Refurbishment and repair is an integral part of Cisco's Circular Economy Model

In addition to providing high quality repair services at competitive prices, refurbishment programs contribute to the circular economy by displacing the environmental impacts of new production and increasing resource efficiency through reuse.[33] Improving the value and availability of refurbished products also encourages their use among businesses and large organizations. These developments are being aided by increasing automation, which enables electronics manufacturers to automate device assessments and refurbish parts at an industrial scale to reduce costs.[34]

Recycle

Environmental Impact of Recycling

According to the Bureau of International Recycling, recycling metals contained in electronic products, such as aluminum, copper and ferrous metals, results in significantly less energy use when compared to their primary commodity production.[35] As shown below, using recycled materials in products not only reduces waste, but also has the potential to increase resource efficiency. This figure is significant as the electronics industry is the second-largest consumer of copper.[36]

Energy use for primary and secondary commodity production

Materials	Primary Metal Production (TJ)	Secondary Recycled Metals (TJ)	Energy Savings (TJ/100,000T)
Aluminum	4700	266	4434
Copper	1690	657	1033
Ferrous	1400	1194	206

### Finding Value in Post-Consumer Materials

Given these statistics, it is unsurprising that the reuse of post-consumer materials in electronic products is growing. Electronics manufacturers are developing new ways to incorporate post-consumer materials, such as plastics and aluminum, into new products.

Apple's latest MacBook Air is made from a custom aluminum alloy that enables the use of 100 percent recycled aluminum for the first time. This custom aluminum alloy helps reduce the MacBook Air's carbon footprint by nearly 50 percent.[37] In addition, Apple's new Mac Mini will be constructed from 60 percent post-consumer recycled plastic. This alloy delivers the same strength, durability, and finish-without mining any new bauxite (aluminum ore) from the earth.[38]

TCL aims to greatly increase the amount of post-consumer recycled content in their packaging and include more content that can be conveniently recycled over the next few years. For example, TCL has committed to 40 percent of its television packaging containing post-consumer recycled content by 2020.

TCL Roku TV Packaging
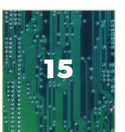
Closed-Loop Recycling

In 2017, **Lenovo** launched the V410Z All-in-One desktop and ThinkVision T22v-10 monitor which contained 12 percent and 45 percent closed loop post-consumer recycled plastics, respectively. Lenovo's Think L notebook also uses up to 30 percent post-consumer recycled content from sources such as office water jugs and IT equipment. Since 2005, Lenovo has used over 90,000 tonnes of plastic materials containing recycled content in its products.[39]

ThinkVision T22V-10

V410Z All-in-One

HP's closed-loop recycling process uses plastic from recycled Original HP cartridges plus recycled bottles and hangers to create new Original HP cartridges. More than 80 percent of Original HP cartridges contain 45-70 percent postconsumer recycled content, and 100 percent of HP toner cartridges contain 5-38 percent post-consumer or post-industrial recycled content. In 2017, the HP ENVY Photo All-in-One Printer series became the world's first in-class printer made with closed loop recycled plastic.[40]

HP ENVY Photo All-in-One Printer

Canon ensures that cartridges collected in Canada are recycled responsibly through a three-step process:
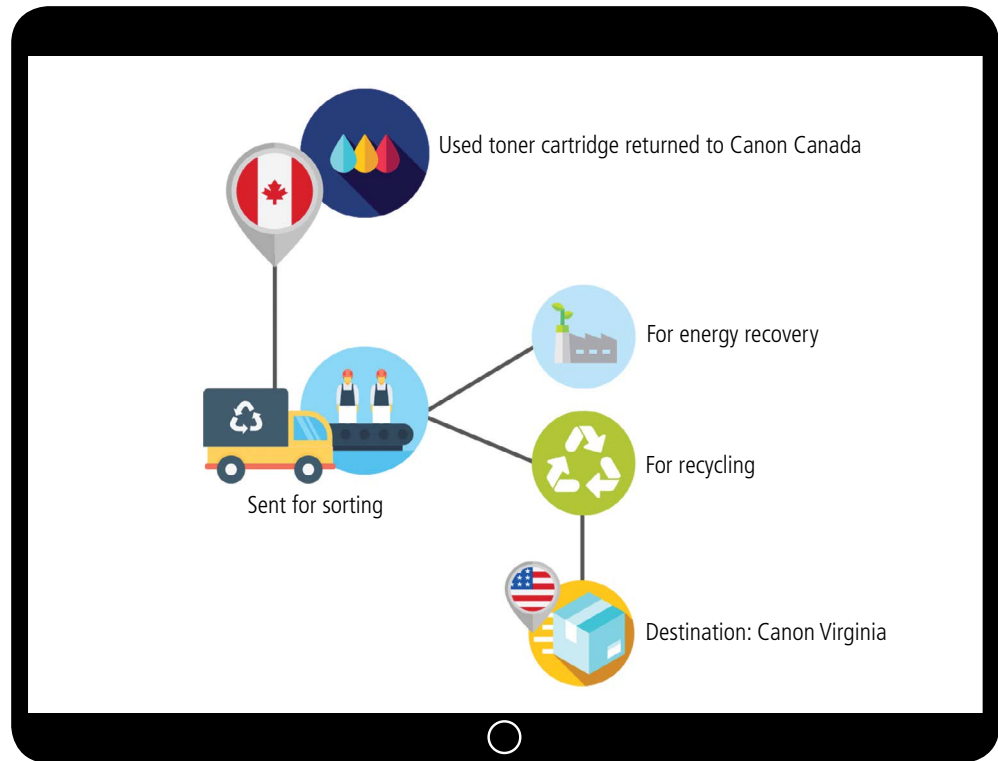

Figure 5: The process of Canon Canada's Toner Cartridge Return Program. Courtesy of Canon Canada Inc.

Canon Toner Cartridge

*In 2018, 397,681 units were processed for recycling and reuse under **Canon Canada's** toner cartridge return program.*

Part 1: Toner Cartridges Returned
Returning used toner cartridges to Canon ensures no parts or materials end up in landfill. A third-party sorting facility separates used cartridges into two groups: eligible-to-be-recycled models are shipped to the United States; ineligible models get safely incinerated for use as a heat source.

Part 2: Open-Loop Recycling
60 percent of materials recovered from used Canon toner cartridges find second life as raw materials in other products or applications, either by Canon itself or by other manufacturers.

Part 3: Closed-Loop Recycling
Canon's product design assumes recycling after use, which facilitates the reuse of components and the recycling of plastic in the manufacturing of new toner cartridges.[41]

Ink and Toner Take-Back and Processing

One of the ways that manufacturers demonstrate their commitment to recycling is through the operation of extensive ink and toner cartridges take back programs in Canada. As summarized below, these programs are free of charge to consumers, and ensure proper recycling and end-of-life processing for cartridges. Remanufacturing is regarded as a circular economy best practice as it prolongs product life, while reducing the need for new materials.

Company	Cartridge Type	Method	Shipping Materials
Brother	Toner	Pre-paid Canada Post shipping labels are provided by opting-in to the Brother Canada Newsletter.	Use of the original packaging of the consumable, or provided by the consumer.
Canon	Toner	Pre-paid mailing labels are provided to return empty consumables to the manufacturer via Canada Post or Purolator.	Use of the original packaging of the consumable, or provided by the consumer.
Epson	Ink and Toner	Used cartridges are returned in an appropriate shipping envelope or box.	Provided by the consumer.
HP	Ink and Toner	Pre-paid shipping materials are provided to return empty consumables to the manufacturer. Other options are return to retail or pallet pickup.	Free shipping envelopes provided as needed.
Lexmark	Ink and Toner	Pre-paid mailing labels are provided to return empty consumables to the manufacturer via Purolator.	Use of the original packaging of the consumable, or provided by the consumer. Shipping bags can be ordered for ink cartridges.
Ricoh	Toner	Pre-paid mailing labels are provided to return empty consumables to the manufacturer via Canada Post or Purolator.	Use of the original packaging of the consumable, or provided by the consumer. A Ricoh toner box can be provided for larger volumes to be sent for recycling.

Plastics Management

CCME

The primary minister-led intergovernmental forum for collective action on environmental issues of national and international concern.

The federal and provincial governments are working together through the Canadian Council of the Ministers of the Environment (CCME) towards a common goal of zero plastic waste. The CCME Canada-Wide Strategy on Zero Plastic Waste focuses on prevention, collection, and recovering value from plastics. Electronics manufacturers are contributing to this goal by reducing the use of plastic in packaging, improving closed-loop collection systems, improving recycling capacity, and incorporating post-consumer plastics into product design.

Cisco has committed to decreasing their use of virgin plastic by 20 percent by 2025, using 2018 as their base year. Where feasible, Cisco will design plastic out of their products and packaging and reduce their overall material use in the process. Where it is not viable to design out plastic, they will increase the use of recycled plastic.[42]

Lenovo is using an innovative bio-based packaging made from bamboo and sugar cane fiber. The material is 100 percent biodegradable, is lighter than previous packaging, and enables a reduction in overall packaging size. The innovative design resulted in 6.7 percent efficiency improvement in transportation CO2 emissions.

Lenovo bio-based packaging.

Dell's overall 2020 goals are to ensure 100 percent of product packaging is sourced from sustainable materials and to ensure 100 percent of that packaging is either recyclable or compostable by 2020. As per 2018's annual report, Dell is 95 percent of the way there.

Reduced multipack, stackable packaging for Dell servers.

Samsung will start taking steps this year to replace plastic packaging materials with paper and other environmentally sustainable elements. From the first half of 2019, the packaging currently used for Samsung's products and accessories, such as mobile phones and tablets, will be substituted with environmentally sustainable materials like recycled or bio-based plastics and paper.[43]

Microsoft employs a "paper first" packaging strategy. Paper makes up 97 percent of Microsoft's packaging material and only 3 percent is plastic. In addition to traditional wood-based papers, Microsoft uses interior packaging derived from bagasse, which is a sugarcane processing waste by-product. In 2019, Microsoft will launch a new commercial packaging system for Surface computers and accessories. This program improves environmental impact by minimizing packaging weight, using a greater percentage of recycled content, and improving space efficiency.[44]

Microsoft Surface Pro 6

Commercial Pilot: Eco Impact Potential (Surface Book)

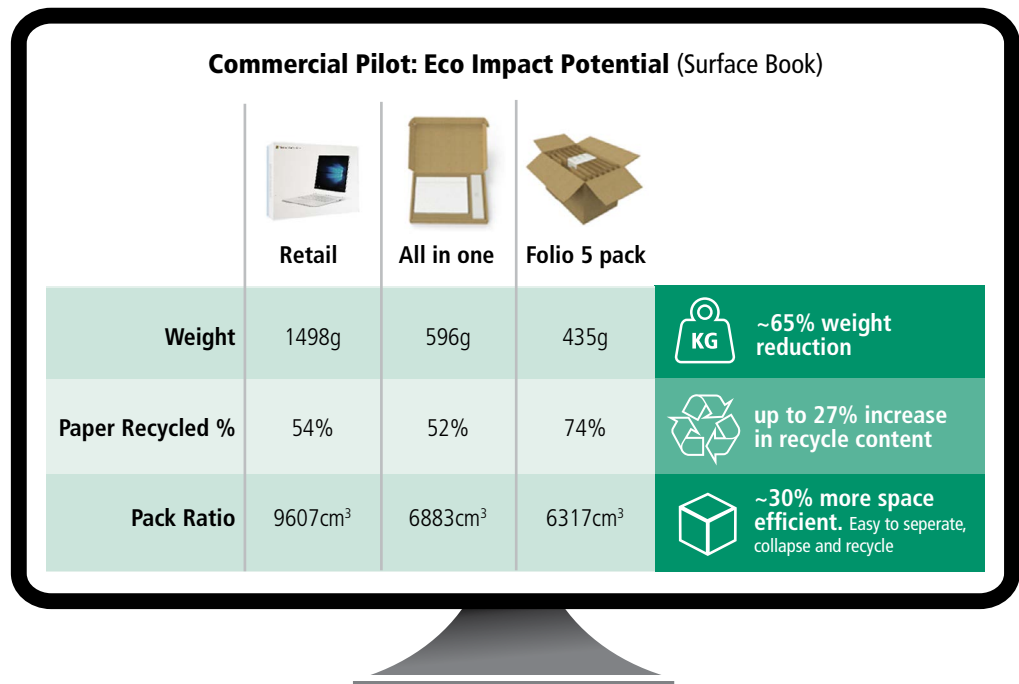|	Retail	All in one	Folio 5 pack	
Weight	1498g	596g	435g	~65% weight reduction
Paper Recycled %	54%	52%	74%	up to 27% increase in recycle content
Pack Ratio	9607cm³	6883cm³	6317cm³	~30% more space efficient. Easy to seperate, collapse and recycle

Figure 6: Microsoft Commercial Pilot: Eco Impact Potential

Supporting the Market for Recycled Plastics

In addition to increasing the use of recycled plastics in products, some electronics manufacturers are working to add value to recycled plastics through innovative methods. Through March 2018, **HP** sourced more than 170 tonnes of likely ocean-bound plastic (over 8.3 million plastic bottles) from Haiti for use in Original HP ink cartridges. HP provided 50 children with educational opportunities, as well as food and medical assistance, and created more than 420 income opportunities for adults.[45]

Today, recycled plastics represent approximately 12 percent of total global plastics production. It is important to provide markets by incorporating recycled plastics into products – especially considering the significantly lower GHG footprint of recycled plastics when compared to virgin plastics (Figure 7).[46]

Public procurement is a powerful tool to stimulate the market for recycled content in electronic products. Given the mandate of governments to tackle societal issues, government procurement is an effective tool for driving a circular economy. Collectively, governments in Canada spend 13.3% of Canada's GDP.[47] This represents a significant untapped opportunity to create a market for recycled content.
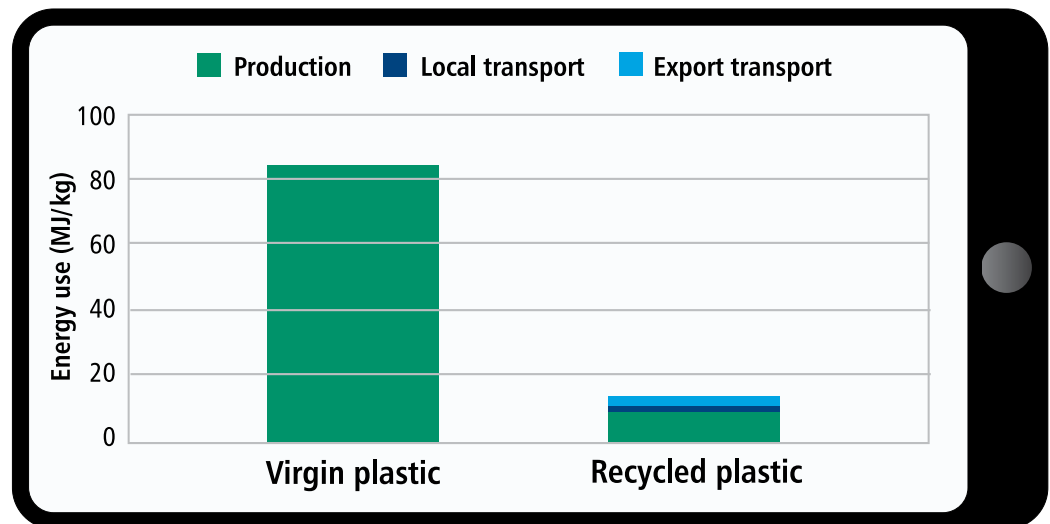

Figure 7: Relative energy intensity of virgin and recycled plastics production

Conservation of Resources

IBM's Bromont, Canada, location operates a deionized water purification system for manufacturing use that generates some rejected water that is reused in the same system. This activity avoided the withdrawal of 24,500 cubic meters of water in 2017. The site also further optimized the deionized water purification system to minimize the amount of water rejected, among other measures, reducing water withdrawals by 799 cubic meters per year. The combined 25,299 cubic meters represented 13 percent of the total water withdrawals at the location in 2017.[48]

Panasonic's Green Plan 2018 aims to expand the range of products that contribute to saving and recycling water. At the same time, Panasonic will work on reducing the volume of water they consume and using more recycled water in their production processes, in order to conserve water resources throughout their business activities. Panasonic aims to complete their water risk assessments for all production sites by fiscal 2019.

*Canadian collection programs have diverted **1,036,559** tonnes of e-waste from landfill.*

Recycling

Canada continues to be a top performer in recycling end-of-life electronic equipment.

In 2017, Canada diverted 115,880 tonnes of electronics from landfill through regulated e-waste recycling programs.[49] This is equivalent to 83,434 tonnes of CO_2, or 17,714 passenger vehicles driven for one year.[50]

The chart below compares the amount of consumer electronics collected under regulated recycling programs around the world.
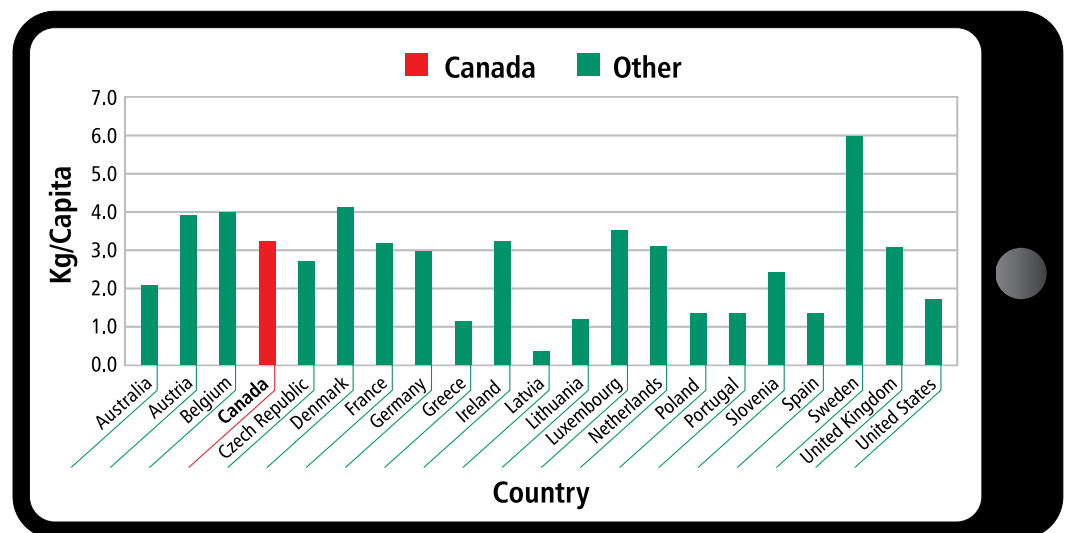

Figure 8: Annual Volume of WEEE Collected in Canada, U.S., Australia (2017), and Europe (2016).[51]

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Electronics Product
Stewardship Canada

About EPSC

EPSC represents the interests of electronics manufacturers for innovation in enhanced end-of-life solutions for electronic products in Canada.

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 standards for the responsible handling of end-of life electronics.

Responsible electronics manufacturers are members of EPSC:

Board Members
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