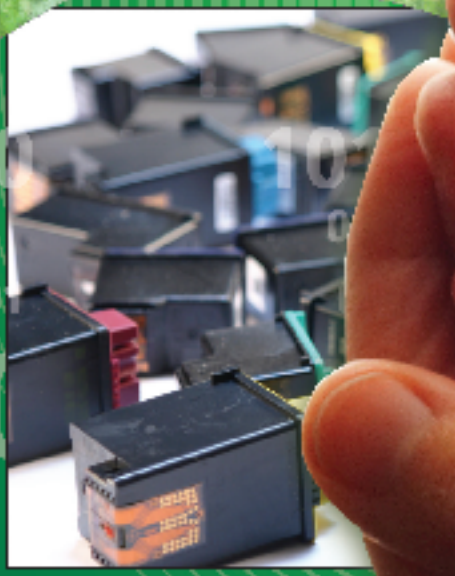
CEA International Insiders Series:

Green Government Procurement
The New Paradigm for Consumer Electronics?



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The United States Government Is Going Green—In Electronics

Consider this: The United States government accounts for seven percent of the world's computer purchases.[1] With an information technology (IT) budget that exceeds $65 billion, the U.S. has recently taken on the task of strengthening its environmental management of electronics acquired by federal agencies.

In January 2007, President Bush signed Executive Order (E.O.) 13423, "Strengthening Federal Environmental, Energy and Transportation Management." The order sets environmental goals in several areas that are important to the consumer electronics (CE) industry including acquisition, design, materials choices, distribution, energy efficiency and recycling.

The E.O. is a major step in the federal government's efforts to reduce the environmental footprint of federal government agencies, while enhancing the market for green products and services these agencies procure. Section 1 of the E.O. states:

It is the policy of the United States that federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continually improving, efficient, and sustainable manner.

The E.O. sets specific purchasing goals and other deliverables for federal agencies and their contractors. Some of these goals are already being met by past E.Os. The new E.O. essentially lays out strict guidelines for how federal agencies and facilities should purchase products that meet the government's environmental requirements and adds a memorandum of understanding for electronic product stewardship.

From a management perspective, the order clarifies and expands the roles and responsibilities of the White House Council on Environmental Quality (CEQ), the Office of the Federal Environmental Executive (OFEE), the Office of Management and Budget (OMB) and the Department of Energy (DoE), all of which will serve as the E.O. Advisory Group. The OFEE, the DoE's Federal Energy Management Program (FEMP), EPA, and the U.S. Department of Agriculture (USDA) will continue to conduct sustainable practice workgroups to implement the statutory requirements addressed in E.O. 13423.

The E.O. also calls for existing and new working groups within Federal agencies to develop the tools and guidance needed to implement sustainable practices. Progress will be measured and reported to the President and the OMB.

The OFEE has formed a working group that will determine what options are available to capture and report data on green electronic procurements by federal agencies. The OFEE has formed a multi-agency task force to deal with this issue and is expected to make recommendations to the OMB by late summer or early fall 2007.

One element in the EO is the use of renewable and bio-based energy and energy efficiency, as well as the reduction of toxic and other hazardous materials. Another key component of the EO is the preferential purchasing of Electronic Products Environmental Assessment Tool (EPEAT) registered products. EPEAT, developed over a three year period in an extensive multi-stakeholder process funded by the U.S. Environmental Protection Agency (EPA), has become a standard, easy-to-use purchasing tool to help purchasers rank computer desktops, laptops, and monitors based on environmental attributes. All EPEAT-registered products have been listed in an online database on the EPEAT Website at www.epeat.net.

Most federal agencies have committed to the purchasing IT hardware under the recently published E.O. and will continue to revise their own internal processes to comply with and strengthen their rules covering future acquisition of "green" computers and other electronics. Federal agencies are demonstrating their commitment to the Electronic Stewardship aspects of the E.O. through new goals that recognize the successful use of environmental management systems (EMS), and the Federal Electronics Challenge (FEC) that seeks to reduce the environmental impacts associated with computer purchases and disposal.

An Electronics Stewardship Plan

One of the key elements of E.O. 13423 is Electronics Stewardship, which calls on each agency to "seek to reduce" the environmental and energy impact of how they purchase, use and dispose of electronics equipment, and through regular improvements to the acquisition, design, specifications, material choices and distribution of new electronics equipment.

In implementing the policies set up under the E.O., the stewardship plan ensures that federal agencies procure products that are environmentally friendly and must ensure that at least 95 percent of the electronics products powered by the agency are EPEAT registered (unless there is no EPEAT standard for such products), that it enables ENERGY STAR® features on agency computers and monitors, and establishes and implements policies to extend the useful life of agency electronic equipment. Agencies also must use environmentally sound practices when they determine that electronics equipment has reached the end of its useful life.

The stewardship also requires that contracts entered into after the effective date of the order comply with the provisions of the E.O.

The Electronics Stewardship Plan required every federal agency to develop and submit to the OFEE by May 1, 2007 a plan to implement electronics stewardship practices for all eligible owned or leased electronics equipment. The plan required the agencies to address three lifecycle phases for electronics assets—acquisition, operations and maintenance, and end-of-life.

Federal Electronics Challenge

Another important aspect of Electronics Stewardship is the Federal Electronics Challenge (FEC), a partnership program that encourages federal facilities and agencies to purchase greener electronics products, reduce the impact of electronics products during use and manage obsolete electronics in an environmentally safe way.

Federal agencies and facilities participate as "partners" in the program. The FEC provides partners with resources and technical assistance for improving electronics management practices. The program is managed by the U.S. EPA and the OFEE.

The FEC program targets desktop and laptop computers and monitors, computer peripherals, televisions, printers, fax, copier machines and mobile phones.

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The FEC has the following goals for 2008:

- Ninety-five percent of desktop and laptop computers and monitors purchased by eligible FEC partners are EPEAT – registered.
- 100 percent of the electronics products purchased by FEC-eligible partners have an average life span of at least four years.
- ENERGY STAR® features will be enabled on 100 percent of computer monitors in operation at eligible FEC partner facilities.
- 100 percent of eligible FEC partners' non-reusable desktop and laptop computers and monitors will be recycled using environmentally sound management as defined by the EPA's Plug-In to eCycling guidance.

These FEC national program goals represent where the FEC would like all partners to be by 2008.

Adopting Environmental Management Systems

The new E.O. also calls for more widespread use of Environmental Management Systems (EMS) – to manage and continually improve environmental and data management programs. EMS is to be used at all appropriate organizational levels of the government as the primary management approach for addressing environmental activities.

Under the E.O., each agency, at all organizational levels, will develop, implement, and maintain an EMS to identify and address agency environmental and energy issues. Once implemented, the senior management of each agency is expected to review their EMS at least annually. The EPA, working with the OFEE and DoE, also is required to develop guidance on incorporating the new E.O. goals into EMS.

The E.O.'s goal is to implement EMS in at least 2,500 federal operations by 2010, up from about 1,000 today.

U.S. Federal IT Budget Highlights

The U.S. Fiscal Year 2008 Information Technology budget provides $65.5 billion in funding for IT investments, an increase of 2.6 percent from the FY 2007 IT request of $63.8 billion.

Data on green electronic procurements by U.S. federal agencies will not be available until later this year, but some of this information is available through close examination of outstanding IT contracts for hardware, software and services. Efforts are underway to include the requirements of E.O.13423 into existing contracts. Federal environmental officials also credit the E.O. with forcing the IT community to become more engaged in the process of meeting the E.O.'s requirements.

Several examples of IT procurements by key federal agencies follow:

General Services Administration – A multi-award/indefinite delivery and quantity IT contract valued at up to $50 billion. The GSA contract specifically encourages contractors to participate in EPEAT. Additional considerations are being given to products meeting silver- and gold-level EPEAT requirements.

Department of Homeland Security – About $6 billion for contracts covering five years with a two year extension option. The DHS is active in the Federal Electronics Challenge program. During the term of the contract, the DHS reserves the right to purchase exclusively models of desktop and notebook computers and monitors qualified under EPEAT.

Veterans Administration – With IT contracts valued at $4.2 billion over five years, the VA has cancelled its PC hardware and software contract development and will purchase EPEAT-registered products through NASA's Science & Engineering Workstation Procurement (SEWP) IV contract program.

NASA – The space agency has an estimated 40 contracts valued at $5.6 billion each for a total of about $224 billion over seven years for SEWP. The Department of Defense, Department of Justice, Department of Commerce and now the VA, all use this contract, which requires that its IT procurements meet EPEAT directives.

Department of Transportation – The DOT issued contracts covering more than $200 million over five years for IT hardware was awarded in September 2005. EPEAT restrictions have been included in the hardware specifications and RFPs. Vendors must declare whether or not they could meet the specifications and demonstrate how they will continue to meet the EPEAT requirements for each model they propose.

Department of Energy – The DoE issued $400 million in IT contracts in January 2003 that cover three years with a two year renewal option. All products must meet EPEAT-requirements, with similar requirements for laptop computers and monitors purchased in FY2007. The DoE also distributed an Acquisition Letter for purchasing EPEAT-registered products covering FY2007.

U.S. Army – Two programs, one for $5 billion for desktop and mobile computing that covers 10 years, and a second program for $10 billion, also for 10 years, for IT enterprise solutions.

Environmental Protection Agency – The EPA has issued agency-wide IT contracts totaling $24 million over five years. All electronics procurements must meet or exceed EPEAT's bronze registration requirements. However, the EPA is giving additional consideration to electronics products that meet EPEAT silver and gold requirements. EPA vendors also must provide quarterly reports quantifying the number of EPEAT-registered products purchased under the contract and must report this information for the duration of the contract.

Executive Office of the President – A $7 million IT contract over five years. All desktop computers must meet all EPEAT, EPA and ENERGY STAR® guidelines, and have ENERGY STAR® labels or be certified by an independent third-party eco-labeling program.

Several states also have strict environmental restrictions on their electronics procurements. For example:

California – The California Integrated Waste Management Board has adopted EPEAT requirements, and, in partnership with the California Department of General Services, has developed Guidelines for Procurement Use and End-of-Life Management of Electronic Equipment.

Massachusetts – In 1999, the state issued an RFP for computer equipment that required ENERGY STAR® products and rated vendors on a full range of environmental features. The state's IT budget is $70 million, including services.

Minnesota – The state's central purchasing agency has gone through the process of identifying and selecting several environmentally preferable products. To reduce the quantity of toxicity of waste in Minnesota, state law requires state agencies and other public entities to purchase recycled, repairable and durable goods.

City of Seattle – Seattle RFPs for laptop computers now require vendors to answer a questionnaire about the environmental attributes of their products.

The E.O.'s Impact on Consumer Electronics

What impact will the E.O. have on CE manufacturers including PC and wireless product vendors?

The E.O. is a broad-based environmental management directive from the President to federal agencies and was not aimed at the CE market. But as it relates to EPEAT-registered products, it is expected to have a significant impact on PC vendors and, eventually, the CE community at large. EPEAT has been integrated into the more than $40 billion of federal IT contracts and/or requests-for-proposals (RFPs) to date, but that doesn't mean that government agencies are committed to purchasing $40 billion in EPEAT products.

Currently, EPEAT regulations cover only desktop and laptop computers and monitors. However, other product categories are under consideration for EPEAT registration, including TVs and other display products; imaging devices, including printers and copiers; cellular phones; PDAs, and computer servers. If stakeholders and standards developers decide that wireless products are in need of an environmental performance standard, they may develop a new standard for these products under the EPEAT system. Other issues under consideration are the timing of the rollout of adding products to the EPEAT system, particularly as it would apply to the transition from analog to digital television.

EPEAT was developed over a three year period in an extensive multi-stakeholder process funded by the U.S. EPA. The program represents environmental groups, government officials, large volume computer purchasers, electronics recyclers and manufacturers.

The Green Electronics Council (GEC) administers EPEAT, but also works with environmental organizations, government agencies, manufacturers and other interested stakeholders to improve the environment and social performance of electronics products.

Manufacturers participating in EPEAT are required to file reports with the GEC at the end of each year detailing the number of EPEAT-registered products they sold during the year. According to the GEC, approximately 36 million EPEAT-registered products were sold from July 2006, when the program was officially launched, through December 2006. However, these numbers are artificially low since some manufacturers did not begin participating in the program until later in the year. (Also, not all EPEAT-registered products were sold under government contract or because they were EPEAT products—they're simply the sale of EPEAT-registered products.)

As a result, with virtually all major manufacturers now participating in the program and a full year of EPEAT-registered sales to report, 2007 sales of EPEAT-registered products will be substantially higher than in 2006. The GEC is expected to issue an interim report in the summer of 2007 that will include the total number of EPEAT-registered products purchased over a recent nine month period and the subsequent environmental benefits achieved.

When developing the EPEAT standard, the group integrated a wide variety of existing environmental standards and requirements into the EPEAT "umbrella" standard, including the European Union's Restrictions on Hazardous Substances (RoHS), Waste Electrical and Electronic Equipment (WEEE), EU battery directives, the U.S. ENERGY STAR® program, the EPA's Plug-In Guidelines for Materials Management Rechargeable Battery Recycling Coalition recommendations, Coalition of North Eastern Governors Model Toxics in Packaging Legislation and various environmental labeling standards.

EPEAT stakeholders are required to produce an annual report detailing their EPEAT-registered products in aggregate numbers, but broken down by desktop and notebook computers and monitors or integrated models, the only products covered currently under EPEAT regulations. EPEAT stakeholders must file their next annual report by December 2007.

The Industry's Response…

Many electronics manufacturers have been involved in the EPEAT standard and have changed their business models to the extent that they quickly embraced the standard with registered products. At the same time, more manufacturers are responding to the EPA/DoE-sponsored ENERGY STAR® program by creating products that meet those standards. Since 1992, more than half, or nearly 1.1 billion, of these products fall into the CE sector. Because of this, the ENERGY STAR® standards alone have had a tremendous influence on industry and the consumer market.

Intel and Toshiba, for example, recently expanded their environmental programs to include support of EPEAT objectives. HP has nearly 50 products registered with EPEAT and has introduced two supplier training programs, one targeting Central and Eastern Europe and another in China, to ensure adherence to the company's environmental standards.

In May 2007, Nokia introduced the first mobile phones with alerts that encourage their users to unplug the charger once the battery is full, a move it believes could save enough electricity to power 85,000 homes a year. Last year, Nokia chargers were awarded ENERGY STAR® certification for their energy efficiency. By 2010, the company expects to reduce energy consumption of its chargers by an additional 50 percent.

Also, IBM, the largest single operator of data centers worldwide, says it will spend $1 billion a year to double the energy efficiency of its computer data centers and those of its government and corporate clients.

The actions of the federal government to give procurement preference to green products have increased the incentive of the producers of CE products. There is still room for improvement in the energy efficiency and recyclability of these products.

Environmental Activities in the European Union, China, Japan, Canada, Mexico, South Korea and Brazil

European Union

Western European governments are expected to invest $49 billion in IT in 2009, compared with $38 billion in 2004, according to a study by International Data Corp. (IDC). The average growth of government IT spending (5.3 percent) will continue to stay above the IT market average (4.5 percent) throughout 2004-2009, with local governments driving the market.

In March of 2004, the European Union adopted legislation that encourages Member States to include environmental considerations in their government procurement procedures. The "Public Procurement Directive (2004/18) on the Coordination of Procedures for the Award of Public Works, Services and Supplies Contracts" includes specifications on selection, award criteria and performance clauses for green purchasing. To be considered 'green', companies must prove that they comply with all relevant EU environmental standards, or, if they do not follow the same methods, that they at least meet the performance levels set by the standards. The directive highlights that production processes and methods as well as levels of environmental performance can explicitly be taken into account when defining the technical specifications for public works, supply or service contracts.

The directive also includes specifics regarding the purchase of energy-efficient computers and buildings, office equipment made of environmentally friendly materials, sustainable timber, recyclable paper, electric cars, etc. Companies interested in competing for such contracts are directed to the EU Handbook on Environmental Public Procurement published in October 2004. Additionally, more information can be found on the EC's website: http://www.europa.eu.int/comm/environment/gpp/index.htm

Most European countries have had green laws on their books for years, but nothing like what hit the electronics industry when the European Union (EU) enacted the Restrictions of Hazardous Substances (RoHS) directive that established limits for the use of six hazardous substances in electronics equipment sold into each of the EU's 27 member countries.

The directive, which went into effect July 1, 2006, was a long time coming. With the European Environmental Agency calculating that the volume of electronics was rising about three times faster than any other form of municipal waste, the EU and most of its members believed they weren't being aggressive enough in tackling less traditional environmental issues, such as e-waste.

Under EU RoHS Directive 2002/95/EC, literally hundreds of thousands of electronics products, ranging from semiconductors to the full range of CE and other electronics products, almost immediately became candidates for redesign.

Companies not in compliance with the RoHS directive by the July 2006 deadline could not sell their products into EU-member countries until they met the requirements of RoHS. It was soon followed by another EU directive, Waste Electrical and Electronic Equipment (WEEE), which assigns manufacturers responsibility to take back equipment at the end of its lifecycle, to recycle parts and safely dispose of toxic materials.

Additional, more focused, environmental directives are being adopted by the EU, including the Energy using Products (EuP) directive that calls for the development of more energy-efficient products, and Registration, Evaluation, Authorization and Restrictions of Chemicals (REACH) directive, which requires the chemical industry to put health information on chemical products in the EU market.

The industry, with few exceptions, has responded to these directives, spending (in many cases) millions of dollars to redesign their products and help their customers comply with the EU's directives.

The EU has hired research teams from Environment Consultancy and Assistance (ECOLAS) and Risk & Policy Analysis (RPA) to study the impact of RoHS and WEEE on the electronics industry.

The RoHS study will attempt to quantify the economic and environmental impacts of the RoHS directive through a cost-benefit analysis. The RoHS questionnaire will focus on compliance costs and benefits, the technical costs of RoHS product phase-outs and the social impact of the directive.

The WEEE study will assess how the directive affects innovation and competition and seeks to identify factors and requirements with critical positive or negative defects. The WEEE questionnaire will focus on the overall WEEE implementation costs to companies, costs associated with research and development, producer responsibility schemes and trade issues. The deadline for the final RoHS and WEEE reports are December 15, 2007.

Meanwhile, the United Nations has launched its own global initiative to reduce electrical and electronic waste. The program called, Solving the E-Waste Problem (StEP), estimates the world's annual volume of e-waste will exceed 40 million tons in the near future.

The StEP Initiative was created by the UN University, the UN Environment Program (UNEP) and the UN Conference on Trade and Development (UNCTAD). Other charter partners include the U.S. EPA, the Massachusetts Institute of Technology (MIT), the University of California at Berkeley, the Chinese Academy of Sciences, and several European universities and scientific institutions.

The goal of the StEP initiative is also to educate communities about the importance of recycling of electronics products. According to the United Nations University, transition and developing countries do not have the proper methods to treat e-scrap.

"There is a clear need and opportunity now to address the resources, health and environmental concerns being created by a surging increase in electronic waste," according to the United Nations Under Secretary-General Hans van Ginkel. He added that "the StEP Initiative will point the way for governments, companies and consumers alike to reverse this growing international problem."

China

IT procurement numbers for China are hard to come by, mainly because the biggest suppliers are major commercial vendors, including IBM. What has been made clear in surveys taken in 2006 is that Chinese organizations purchasing IT hardware don't always meet Chinese application needs or specifications. Analysts believe this could very soon open the door to Chinese IT companies to begin to compete more effectively with U.S. suppliers.

China now accounts for an estimated 15 percent of the global semiconductor market, with growth projected at an annual rate of more than 20 percent through 2008, which is likely to place additional emphasis on its "green" product procurements.

In 2002, China published the 'Government Procurement Law' which included various requirements for green government procurement in-

cluding a preference for 'environmentally friendly products' to 'promote environmental protection and economic sustainable development'. This law was made mandatory in May 2007. Procurement of green products refers to a list of fourteen product categories, with nearly 3,000 different products. This list of approved green products for government purchase includes printers, copiers, televisions, computers and other electronic products. The scope of the product list will be adjusted depending on the needs of the government. In order to ensure a product is placed on the list, producers must register with the Chinese Ministry of Finance and State Environmental Protection Agency (SEPA). More information can be found at www.sepa.cec.com.

China's response to the EU's RoHS directive has become one of the most closely watched environmental developments in the world by the global electronics industry. But the so-called China RoHS isn't that country's first response to the needs of environmental legislation.

In 1994, China introduced a broad environmental plan, known as China 21, aimed at achieving sustainable development. In 1996, the State Council issued a five-year plan on environmental protection. In general, policies are formulated by the State Environmental Protection Administration (SEPA), which was set up in 1998. SEPA's role is to disseminate national environmental policy and regulations and provide technical advice on national and international environmental issues. SEPA's actions require State Council approval.

China has responded to the EU's RoHS directive with its own version of RoHS, "Administration on the Control of Pollution Caused by Electronic Information Products," which went into effect March 1, 2007.

While both directives, the EU's RoHS and China RoHS restrict usage and amount of control toxic and hazardous substances (lead, mercury, cadmium hexavalent chromium, polybrominated byphenyls and polybrominated diphenyl ethers), the EU directive becomes binding when the member state's law adopts the directive, while China's RoHS version is automatically binding.

Also, China RoHS focuses on electronics information products with voltage of less than 1000Vac or 1500Vdc (medical equipment, measurement and control equipment have been temporarily exempted). China RoHS also formulates its restrictions by the "list method," whereby all regulated products are included. The EU RoHS directive encapsulates all regulations of the WEEE directive and then employs an exemption method.

Under China RoHS's two-step approach, manufacturers had until March 1, 2007 to declare compliance with the new law for all electronics information products entering into the Chinese market. Manufacturers of products within scope must use product labels that indicate the presence or absence of the six specified hazardous substances, and indicate their location within an electronics product. Manufacturers must either substitute toxic and hazardous substances or meet the limit(s) set by the standard(s). They must meet China Compulsory Certification (CCC) before entering the market.

In addition, under China RoHS, certain products must be tested and certified in one of 18 CCC laboratories before the product can be placed on the market in China.

Japan

Japan is generally well ahead of the global curve in protecting the environment. In fact, most of Japan's CE manufacturers have been specifying lead-free materials and the removal of other toxic substances from their suppliers' components for several years.

Japan has several environmental laws in place that impact electronics products. The Japan Green Procurement Survey Standardization (JGPSSI) is a voluntary collaboration of Japanese companies to qualify and select suppliers by surveying them using a standard form. To be fully qualified as vendors to Japanese CE manufacturers, suppliers must eliminate up to 35 hazardous substances from their products. Despite these stringent requirements, several Japanese manufacturers have developed programs that go beyond the requirements of the JGPSSI in pre-qualifying vendors.

Japan also has developed a program called the "3Rs" (reduce, reuse and recycle), which calls on the industry to voluntarily recycle its products and materials. As part of its 3R Policies, Japan has released a set of guidelines on recycling for items and industries not subject to certain laws and regulations.

Virtually all of Japan's larger electronics companies have established chemical project teams or departments to ensure their compliance with the EU's RoHS and have developed chemical substance control manuals for RoHS and Waste Electrical and Electronic Equipment (WEEE) directives. They also have increased their screening and analytical capabilities and have implemented chemical substance control systems.

Canada

The Canadian Environmental Protection Act 1999 (CEPA 1999) covers a range of activities, including managing chemical substances. CEPA 1999 requires that every chemical substance produced in Canada or imported from other countries since 1994 be assessed against specific criteria. In 2006, Canada completed the major task of systematically sorting through the approximately 23,000 existing substances introduced into Canada before the creation of CEPA 1999.

The Canadian Council of Ministers of the Environment (CCME) created Electronics Product Stewardship Canada (EPSC) in June 2004 to develop a national electronics end-of-life program in Canada. As a not-for-profit organization, EPSC works with an array of partners and stakeholders to design, promote and implement sustainable solutions for Canada's electronics waste problem.

Initially, the organization focused on desktop and laptop PCs, monitors, TVs, and printers but additional electronic materials are being added as the program develops.

EPSC's plan is to develop a national program and establish environmental handling fees across the country for every major electronics product category. The plan also calls for national reporting to ensure transparency and accountability.

In October 2006, Canada's electronics industry released its first report on improvements in environmental design of CE and information and communications technology products. The report, "Designing for the

Environment," was prepared by EPSC, representing 21 of Canada's leading electronics manufacturers.

The report details five areas that show significant advances over the last several years: chemical management, energy efficiency, materials management, design for recycling and product expandability. It outlines how companies have reduced environmentally sensitive chemicals in their products and developed and incorporated power-saving features.

The Government of Canada has been doing risk assessment and management for several years. Its List of Toxic Substances currently contains 85 individual families of substances, representing more than 1,000 different chemical substances, including polychlorinated biphenyl (PCB), one of the six substances listed by the EU's RoHS directive.

Environment Canada estimates that more than 140,000 tons of computer equipment, phones, TVs, stereo systems and small home appliances accumulate in Canadian landfills each year. Moving forward, Environment Canada will be working with its federal departments and agencies to review the status of current management systems for sustainable development strategies.

Mexico

The electronics industry in Mexico has been growing steadily with new design centers sprouting up in several locations in proximity to long-standing maquiladoras—factories jointly owned by U.S. and Mexican corporations and operated in Mexico in a 60-mile-wide free trade zone along the U.S.-Mexican border. But the country's environmental efforts have been slow to catch up with this rapid development.

Mexico's federal regulations on the environment came into effect March 1, 1988 and while they cover natural resources, hazardous waste and toxic substances, they are very broad and were difficult to enforce before the adoption of the North American Free Trade Agreement (NAFTA) in 1992.

With the development of a "side agreement" to the NAFTA treaty, Mexico, Canada and the United States pledged environmental cooperation and developed the NAFTA Council for Environmental Cooperation (CEC) to address regional environmental concerns, help prevent potential trade and environmental conflicts, and promote the effective enforcement of environmental law.

South Korea

IT ranks among the South Korean government's top 10 expenditures. South Korea's current IT spending represents 1.4 percent of the government's total budget. South Korea's Department of Public Administration and Information says that between 1998 and 2001, government spending for IT doubled, from $544 million to $1.1 billion.

Korea has made IT development in the public sector a major enabler of a knowledge-based economy. However, the rapid development of IT-related technologies is faster than the ability of the government to incorporate them. Recognizing this, the government has created government technology centers to map out the future direction of government IT programs.

Environmental laws passed by South Korea in 2003 rely mainly on consumers to maintain a healthy environment. However, Samsung Electronics, the country's largest CE manufacturer, has since developed its own Eco-Partnership program as part of the Green Procurement System it created in 2001 to comply with emerging environmental regulations, promote products with environmental quality and producer more environmentally certifiable products.

South Korea's answer to RoHS/WEEE, called the "The Act for Resource Recycling of Electrical/Electronic Products and Automobiles," was issued to the World Trade Organization (WTO) in March, 2006 and is scheduled to go into effect January 1, 2008. The legislation focuses on three European Union directives—RoHS, WEEE and End-of-Life Vehicles (ELV).

South Korea's laws covering electronics are very broad, and include restrictions on the use of materials, some of which have not been specified. Several important details of the legislation have yet to be worked out—or at least made clear—in terms of its scope, materials and concentration values of chemical substances, although they are expected to be similar to the EU's RoHS. Also, like the EU's RoHS, there will be exemptions for materials with no known substitute.

Brazil

The Brazilian government has been very active in its IT activities, investing $6 billion in IT procurements or an estimated 40 percent of the Brazilian IT market, according to a compilation of independent market research studies.

Brazil has taken its first concrete step toward green procurement. In May 2007, the federal Chamber of Deputies approved a bill that would require the government to take environmental criteria into account in its purchasing (PL 7709/07). The language on environmental criteria is very brief and part of a much larger revision to the federal procurement rules. The bill will be sent to the Senate for approval.

Designing for the Environment

One of the ways CE manufacturers plan to produce more environmentally sound products is by designing them from scratch with the environment in mind. That means using fewer components and materials, eliminating hazardous substances, using more cost-saving recyclable materials, designing products for recycling (that is, designed for ease of disassembly) and focusing more on energy-efficiency.

Several CE companies established Design for the Environment (DfE) programs more than a decade ago, targeting energy efficiency, materials innovation and design for recyclability. Some new products now contain materials recovered from recycled products, an increasingly common practice.

Indeed, some companies have spent well into the millions of dollars designing and redesigning products and investigating new materials to meet the demands of new and anticipated directives requiring more eco-compliant products.

One material that CE manufacturers are experimenting with (and in some cases already designing) is bioplastics for use as housings for

notebook PCs and mobile phones. One of these bioplastics is polylactic acid (PLA), which is produced by fermenting starch from sweet corn and other plants. PLA already is used in biodegradeable medical implants. Other manufacturers are removing arsenic from electronic displays.

With the implementation of the EU's RoHS and WEEE directives, most industry companies already are restricting the use of certain materials in their products.

The EU's Energy using Products (EuP) directive that directly affects products sold in the EU promotes DfE strategies. EuP will develop in phases, but EU member states have until August 11, 2007 to create national laws, regulations and administrative provisions necessary to comply with the directive. These include setting-up inspection regimes, competent bodies and penalties for noncompliance. The EU estimates that more than 80 percent of all product-related environmental impacts are determined during the design phase. One of the critical challenges is designing products with components that are often sourced from hundreds of suppliers in different countries.

Virtually all of the semiconductor and other component manufacturers have been working the DfE issue for years, focusing mainly on power efficiency, but also looking at new process technologies that include development of new transistor materials and structures, innovative circuit and micro architecture designs, packaging materials, and software-optimization techniques that provide comprehensive power-efficient solutions.

The U.S. EPA already has a DfE program that calls for working directly with industry on DfE concepts.

The DfE Computer Display Partnership evaluated the lifecycle environmental impacts of cathode ray tubes (CRTs) and liquid crystal display (LCD) technologies. The study found several areas where improvements can be made during manufacture, including reducing the use of chemicals that contribute to global warming and eliminating the use of mercury.

With annual worldwide tin/lead solder use at about 180 million pounds, the transition to lead-free solders presents a significant opportunity for toxic risk reduction. The DfE Lead-Free Solder Partnership conducted a lifecycle assessment of tin-lead and several leading lead-free solder materials to eliminate lead from all electronics products. The electronics industry has access to the results and can use them, with cost and performance information to guide decision-making.

The Printed Wiring Board (PWB) Partnership has conducted two Cleaner Technologies Substitutes Assessments with the PWB industry, identifying cleaner alternatives in the PWB manufacturing process.

Another European-initiated program known as Integrated Product Policy (IPP) is looking at how to environmentally improve the design of products with the greatest potential for environmental improvement. Nokia has undertaken a pilot project on IPP at the request of the European Commission with support from the European Information, Communication and Consumer Electronics Technology Industry Association (EICTA).

EPEAT Gives Government Agencies a Running Start

The program that has been critical to giving federal government agencies a running start on going green is the EPEAT. Other than closely tracking the IT procurements of each federal agency, just about the only data available currently on how much green electronics is being procured by federal agencies comes out of EPEAT-standard procurements. EPEAT was referenced last year in almost $22 billion worth of computer contracts, including contracts issued by the Department of Defense, Department of Homeland Security and NASA.

The EPA has estimated that over the next five years, purchases of EPEAT-registered computers will result in reductions of more than 13 million pounds of hazardous waste and more than 600,000 MWh of energy—enough to power six million homes. The development of EPEAT was prompted by the growing demand by institutional purchasers for an easy-to-use evaluation tool that allows the comparison and selection of electronics products based on environmental performance, along with cost and performance considerations.

Using EPEAT, manufacturers declare their products' conformance to a comprehensive set of environmental criteria in eight performance categories:

- Reduction/Elimination of Environmentally Sensitive Materials
- Material Selection
- Design for End-of-Life
- Product Longevity/Life Cycle Extension
- Energy Conservation
- End-of-Life Management
- Corporate Performance
- Packaging

EPEAT is administered by the Green Electronics Council (GEC). Before manufacturers can use the EPEAT system to declare their products they must sign an agreement with the GEC that requires them to be truthful in their declarations. They also must pay an annual fee. In order to maintain the credibility of the system, the GEC regularly selects products from the registry and verifies that the declaration is accurate. If the GEC finds that a declaration is not accurate, the manufacturer must correct it or it will be removed from the registry.

EPEAT evaluates electronics products to three tiers of environmental performance—bronze, silver and gold. The complete set of performance criteria under a standard developed by the Institute of Electrical and Electronics standard, known as IEEE 1680, including 23 required criteria and 28 optional criteria in eight categories. The IEEE 1680 standard includes the full text of each criterion. To qualify for acceptance as an EPEAT product, it must conform to all the required criteria. Manufacturers may pick and choose among the optional criteria to boost their EPEAT baseline "score" to achieve a higher-ranking level as follows:

For more information about EPEAT, see www.GreenElectronicsCouncil.org/epeat. ■

CEA
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An analysis of the IPP approach in a recent report by Cyon Research Corp., notes "At the heart of IPP is the principle that the biggest improvement in environmental impacts of products can be made during the design phase, rather than through process efficiency, cleaner production or pollution management."

Current efforts may not be sufficient. Gartner, Inc., a market research and consulting firm specializing in technology, suggested in "Facing the Challenge of Worldwide 'Green' Legislation," a report published in November 2006 that electronic equipment manufacturers invest in research and development to align their products with future green regulations, not just those in force today, as more governments around the world impose regulations on substances that may harm the environment.

Japan has had environmental laws that specifically apply to the electronics industry since 2000 and passed amendments to those laws that came in effect in July 2006. China, South Korea, Australia, Taiwan, the 27 EU member states, and California have also introduced or strengthened their environmental regulations.

"Failure to transition products [to DfE concepts] on time can lead to high inventories and dramatic price cuts, similar to the effect we saw in Western Europe as the RoHS came into effect," Gartner stated in a report. "Non-compliant components will be gradually removed from the global supply chain and force manufacturers to discontinue products that contain them."

In Gartner's view, non-green parts will be assigned end-of-life status and green legislation will eventually impact every PC manufacturer. "The worldwide market should expect to see longer lead times, part shortages and rising prices for non-compliant parts over the next two years."

Gartner says equipment manufacturers must look for ways to go beyond the requirements of green legislation, and suggests that efforts to develop more eco-friendly products and increasing consumer awareness of "green" features will enable product designers to promote market differentiation.

What's Next?

Manufacturers can count on additional "green" legislation coming from all levels of government, even as they upgrade their products—from the EU and its member states, other nations of the world that will most likely continue to update the language of their directives as technologies and other requirements demand, and, in the case of the U.S., state-level electronic waste (or e-waste) laws. Rule changes from U.S. environmentally-focused agencies are also likely and have already begun.

The U.S. EPA's Version 4 of ENERGY STAR® specifications is just one example. The EU has revised its 1991 directive on batteries and the EPA also has updated its regulations covering the recycling of cathode ray tubes (CRTs) in an effort to encourage more extensive recycling.

Businesses that want to participate in federal procurement programs will have to stay on top of environmental laws and regulations. One current example:

The U.S. Congress is considering a proposal that would create a new federal-level energy research agency patterned after the Pentagon's Defense Advanced Research Projects Agency (DARPA). The House Science and Technology Committee held hearings in late April 2007 on legislation that would create an Advanced Research Projects Agency for Energy (ARPA-E). A bill introduced in the House (H.R. 364) would establish ARPA-E and create an "Energy Independence Acceleration Fund" to pay for energy research projects, but it not clear at this point what kind of an impact ARPA-E would have on the development of new electronics products or systems.

1 "Status and Future Directions of the ENERGY STAR® Program," published in the Proceedings of the 2000 ACEE Sumer Study, Lawrence Berkeley National Laboratory.

ENERGY STAR

ENERGY STAR®: Updated PC, Digital Cable Specifications

ENERGY STAR® is a joint program of the U.S. EPA and the U.S. DoE aimed at helping consumers and businesses to save money and protect the environment through energy efficient products and practices.

Launched in 1992, ENERGY STAR® was introduced as a voluntary labeling program designed to identify and promote energy-efficient products. Computers and monitors were the first labeled products. The ENERGY STAR® label now appears on home electronics, major appliances, office equipment, lighting and other products to indicate they have met certain energy efficiency specifications developed by the EPA and DoE.

Results to date have been impressive: ENERGY STAR® delivered cost savings to businesses, organizations and consumers of about $14 billion in 2006 alone. The program also completed its first revision of the energy specification for personal computers. The new Version 4.0, which takes effect on July 20, 2007, will comply with the top 25 percent of all PCs as measured by energy consumption. The new specification also establishes new criteria in testing.

The EPA's goal is to achieve 40 percent support for the ENERGY STAR® power management guidelines nationally by 2010 and boost this to 60 percent by 2012 and 80 percent by 2014. The new Version 4.0 (Tier 1) includes suggested settings for game consoles as well as computers. Devices not covered by the new guidelines include mid-range and high-end servers, thin clients, and handheld devices such as PDAs. The EPA says a second tier standard will be added to ENERGY STAR® for PCs with more detailed specifications on July 1, 2009.

In addition, ENERGY STAR® has added energy-efficient guidelines for digital cable-ready TVs with a point of deployment slot. Basically, these TVs add the functions of a cable box to TV receivers by using a card available from local cable operators. ENERGY STAR®-qualified versions of these TVs will be available in the future. Meanwhile, the EPA is working on an energy specification for flat-screen TVs.

As part of its support for ENERGY STAR®, CEA released a comprehensive study in January 2007 examining the residential energy consumption of consumer electronics in the U.S. The independent study, commissioned by CEA and conducted by TIAX LLC, shows that CE products consume 11 percent of residential electricity and four percent of total U.S. electricity. The study focuses on 16 product categories, but three product categories account for approximately two-thirds of CE products residential energy consumption: analog television, desktop PCs, and set-top boxes for cable and satellite services.

Another finding of the study is that standby power consumption has decreased in large part to the success of technological innovation and voluntary government-industry programs such as ENERGY STAR®. ■

Wal-Mart Sets Goal to Sell Sustainable Electronics

Wal-Mart Stores Inc. is the retail version of the U.S. government's efforts to buy more green electronics. It's called the Wal-Mart Effect. If you want to do business with Wal-Mart and sell your products through its more than 3,440 U.S. stores, you must adhere to the company's green procurement policies.

Wal-Mart has recently strengthened these policies and released a new set of criteria that will be part of a scorecard used to evaluate CE suppliers on the environmental sustainability of their products. Starting in 2008, Wal-Mart will ask suppliers to fill out the scorecard and its buyers will have the option of using the scorecard results to influence their purchasing decisions.

The scorecard will evaluate electronics on energy efficiency, durability, upgradeability, end-of-life solutions as well as the package containing the product. Wal-Mart has told its buyers to consider the packaging scores when choosing products for its Wal-Mart and Sam's Club stores.

Products also will be evaluated on their ability to use innovative materials that reduce the amount of hazardous substances (such as lead and cadmium) contained in the product. The end result is a score that will show suppliers where improvements can be made and enables Wal-Mart to evaluate the environmental sustainability of the product.

Wal-Mart says some suppliers already are integrating the metrics into their products. In February 2006, Wal-Mart partnered with Toshiba American Information Systems to develop the first European Union's Restrictions on Hazardous Substances-qualified laptop computer in a U.S. retail channel.

To encourage suppliers to start implementing its new environmental policy, Wal-Mart is co-sponsoring a design contest with the Green Electronics Council, which works with environmental organizations, government agencies and manufacturers to improve the environmental performance of electronics products. Suppliers are encouraged to submit a CE product that puts the scoreboard metrics into practice. The winning product will be carried in Wal-Mart's stores nationally. ■

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