



# Regulations Respecting Products Containing Certain Substances Listed in Schedule 1 to the Canadian Environmental Protection Act, 1999

*Statutory authority*

*Canadian Environmental Protection Act, 1999*

*Sponsoring department*

Department of the Environment

## REGULATORY IMPACT ANALYSIS STATEMENT

*(This statement is not part of the Regulations.)*

### **Executive summary**

**Issue:** Mercury is a naturally occurring element that is persistent, bioaccumulative and toxic at very low levels to human health and in aquatic and terrestrial ecosystems. Unlike any other metal, characteristics unique to mercury (liquid at room temperature and extreme volatility), give rise to risks from its use that must be addressed through appropriate risk management measures. The Government of Canada has taken action over the past several years to reduce the risks to human health and the environment posed by mercury.

Internationally, Canada is participating in global negotiations for a legally binding instrument on mercury pollution. Given that the vast majority of mercury pollution in Canada arrives from foreign sources, enhanced global efforts to reduce mercury releases is key to reducing risks to Canadians. As part of the negotiations, parties will consider provisions that reduce the demand for mercury in new products and phase out mercury use in existing products. The use and disposal of products that contain mercury now represents about 27% of Canada's remaining mercury emissions. Without regulation, Canada's product-based emissions are expected to grow as imported products, which tend to have high mercury content, enter the Canadian marketplace in greater numbers.

**Description:** The proposed *Regulations Respecting Products Containing Certain Substances Listed in Schedule 1 to the Canadian Environmental Protection Act, 1999* (hereinafter referred to as the proposed Regulations) would prohibit the manufacture, import and sale of products containing mercury, with some exemptions for essential products which have no viable alternatives (for example lamps, certain health, safety and research applications and dental amalgam). Exempted products would be listed in the Schedule of the Regulations.

The proposed Regulations would allow permits to be granted based on product purpose (critical use vs. novelty), availability of alternatives, risks and benefits for human health and the environment, and end-of-life management practices. Other requirements would include labelling and reporting for permitted and exempt products and, additionally, mercury content limits for products such as fluorescent lamps and neon signs. The proposed Regulations would come into force in 2012.

The proposed Regulations are designed to allow for the future possibility of controlling products containing other substances listed in Schedule 1 to the *Canadian Environmental Protection Act, 1999*, by adding them to the schedule of the Regulations.

**Cost-benefit statement:** From 2012 to 2032, the proposed Regulations would lead to 90 000 fewer kilograms (kg) of mercury entering the Canadian marketplace compared to the status quo. This would reduce environmental releases of mercury by about 54 000 kg, including a

reduction in releases to air of roughly 10 000 kg. Emissions from products currently represent 27% of Canada's mercury emissions to air (which ultimately is responsible for Canada's contribution to the global mercury cycle).

The proposed Regulations would contribute to international efforts to reduce annual global damage costs from methyl mercury, which are anticipated to reach \$10 billion dollars by 2020, while providing direct benefits to the Canadian environment and the health of Canadians.

The discounted costs of the proposed Regulations are estimated to be \$10.1 million over a 20-year period, including a cost to government of \$4.2 million and \$5.9 million for importers and consumers.

Taking into consideration the quantified reductions and non-monetized benefits, the proposed Regulations are estimated to result in benefits that significantly exceed the costs.

**Business and consumer impacts:** Domestic manufacturing of mercury products is limited to lamps and neon signs. These products would be controlled by content limits and compliance is expected to be achievable without incremental investments in capital or reformulation. Most other products containing mercury are imported into Canada and would be subject to similar product regulations in the European Union (E.U.) and many American states.

For consumers, most mercury products have comparably priced and technically equivalent alternatives. In some cases, such as thermostats, mercury-free alternatives offer improved performance and efficiency. Assuming that importers pass on the incremental cost of mercury-free alternatives, consumers would bear a maximum discounted cost of \$5.9 million over 20 years, while receiving benefits in the form of reduced risks to environmental and human health in Canada and globally.

**Domestic and international coordination and cooperation:** The proposed Regulations would complement Canada's diverse policy and program initiatives on mercury by targeting mercury releases from products. The proposed Regulations support Canada's participation in several international initiatives and would align Canada's approach to managing mercury in products with that of the European Union. The United States is also moving toward greater management of mercury products at the federal and state level.

## *Issue*

Mercury is released to the environment and atmosphere by a variety of human activities such as mining, smelting, the burning of coal, and product use and disposal. In the environment, mercury can transform through biological activity into methyl mercury, a harmful organic substance which builds up in living organisms such as fish through their surrounding environments and is concentrated as it moves up the food chain. Human exposure can cause brain, nerve, kidney, and lung damage and in extreme cases coma or death. Exposure to even low levels of methyl mercury can cause neurodevelopmental effects, particularly among vulnerable members of the population such as fetuses and children. By 2020, the estimated cost of global mercury pollution is projected to be roughly \$10 billion per year. ([see footnote 1](#)) In Canada, current environmental mercury levels have led to fish consumption advisories and also pose risks for certain fish-eating wildlife species such as loons and otters.

Canada has already reduced its mercury emissions by roughly 90% since the 1970s through aggressive action to curb industrial emissions. However, an estimated 96% of the man-made mercury pollution deposited in Canada every year arrives from foreign emissions, which travel by air and are deposited in Canada's soil and water. Of greatest concern are mercury levels found in the Canadian Arctic as the region acts as a sink for mercury emitted throughout the northern hemisphere. Northern populations are exposed to particularly high levels of methyl mercury which accumulates in food sources such as fish and marine mammals. As such, Canada is working alongside the global community through the United Nations (UN) to negotiate a legally binding instrument that strengthens action on mercury for 2013. ([see footnote 2](#))

In preparation, the UN has asked negotiating parties to consider provisions that reduce the demand for mercury in products. Specifically, parties will consider options that prevent the introduction and use of new mercury products and phase out the manufacture and sale of existing mercury products. ([see footnote 3](#)) The use and disposal of mercury products now represent about 27% of Canada's remaining mercury emissions. Action by Canada on consumer products would substantially reduce Canada's remaining mercury emissions, help reduce worldwide mercury pollution and strengthen the likelihood of a binding

global agreement.

Without regulation, Canada's product-based emissions are expected to grow as imported products, which tend to have high mercury content, enter the Canadian marketplace in greater numbers. For example, the market for mercury lamps is projected to grow by 25% annually until 2013 and remain high beyond 2019 as incandescent lamps are phased out in favour of more energy efficient mercury fluorescents. ([see footnote 4](#))

The proposed Regulations would have a positive impact on the Canadian environment. Mercury's high level of toxicity means that even very small reductions can yield significant benefits. For example, the mercury in a typical thermometer diluted in a body of water could contaminate up to 11.5 million litres (five Olympic-sized swimming pools) beyond Canadian limits for the protection of aquatic life. There would also be additional benefits for the global community as some of the mercury emitted in Canada would deposit around the world.

Addressing the risks associated with mercury in products is the next step by the Government of Canada to reduce environmental releases of mercury, and is being carried out as part of the Government of Canada's Chemicals Management Plan. ([see footnote 5](#))

### **Objectives**

The objective of the proposed *Regulations Respecting Products Containing Certain Substances Listed in Schedule 1 to the Canadian Environmental Protection Act, 1999* is to reduce releases of mercury and its compounds (hereinafter referred to as mercury) from products used in Canada to the lowest level possible. Canadian actions on mercury in products will contribute to global efforts to reduce world-wide mercury pollution and its associated costs. It will also result in a small reduction in the amount of mercury accumulating in Canada's environment, which would result in corresponding benefits for Canadians.

### **Description**

Under the authority of the proposed Regulations, the Government of Canada would control the manufacture, import, and sale of mercury-containing products that enter the marketplace. The proposed Regulations will contribute towards a comprehensive risk management strategy for products that would also involve future initiatives to collect mercury products that enter the waste stream, and explore the long-term need to retire surplus mercury generated by reduced demand and recycling. ([see footnote 6](#))

### **Application**

The proposed Regulations are designed to allow for the future possibility of controlling products containing other substances listed in Schedule 1 to the *Canadian Environmental Protection Act, 1999* (CEPA 1999). At the time of publication of the proposed Regulations, mercury is the only substance targeted. Any addition of a substance would be done according to the regulatory and consultative processes under CEPA 1999 and would require amendments to the proposed Regulations as well as the development of a separate Regulatory Impact Analysis Statement and pre-publication in the *Canada Gazette*, Part I.

It should be noted that the proposed Regulations would not apply to the incidental presence of mercury in products such as food, paint and cosmetics. The proposed Regulations would also not apply to waste, recyclable materials, drugs (within the meaning of section 2 of the *Food and Drugs Act*), veterinary biologics (within the meaning of section 2 of the *Health of Animals Act*), and ammunition and explosives under the control of the Minister of National Defence. None of the provisions in the proposed Regulations would apply to these products.

### **Prohibitions**

As per the proposed Regulations, a person must not manufacture, import, or sell any product that contains mercury. All products containing mercury would be prohibited (with certain exemptions) including thermostats, thermometers, switches and relays, batteries, measuring and control devices, and tire balancers.

Essential products with no viable alternatives such as mercury-containing lamps would be exempted and would be assigned maximum content levels (when possible) in the schedule of the proposed Regulations (See Table 1). Products listed in the schedule would be subject to periodic reviews that assess the availability of alternatives. In addition a person may sell, or offer for sale, any product that contains mercury if the product was manufactured or imported before the coming into force of these proposed Regulations.

The following table lists essential products that would be exempted and the maximum quantities that would be permitted:

Table 1: Summary of Proposed Maximum Mercury Content Levels

<b>Mercury-containing product</b>	<b>Mercury content limit in the product</b>	<b>Mercury-containing product</b>	<b>Mercury content limit in the product</b>
Compact fluorescent lamps	3.5 mg	Non-linear fluorescent lamp for general lighting purposes, including a circular or square fluorescent lamp	15 mg
Linear fluorescent lamp for general lighting purposes	5 mg	Induction fluorescent lamp for general lighting purposes	15 mg
Mercury vapour lamp for general lighting purposes ( $\geq 40$ W and $\leq 1\ 000$ W)	(i) 50 mg until Dec. 31, 2015 (ii) 0 mg after Dec. 31, 2015	High pressure sodium vapour lamp	40 mg
Metal halide lamp ( $\leq 300$ W)	40 mg	Metal halide lamp ( $> 300$ W and $\leq 700$ W)	65 mg
Metal halide lamp ( $> 700$ W and $\leq 1\ 000$ W)	150 mg	Automobile headlamp	5 mg
Cold cathode fluorescent lamp less than 1.5 m in length	5 mg	Cold cathode fluorescent lamp more than 1.5 m in length	
External electrode fluorescent lamp less than 1.5 m in length	5 mg	External electrode fluorescent lamp more than 1.5 m in length	13 mg
Cold cathode tubing for signage or cove lighting	100 mg per 2.44 m	Fluorescent and discharge lamp for special purposes other than those set out in these Regulations	No limit
High tech micro switches and relays for monitoring and control equipment	20 mg	Thermometer for laboratory or scientific research applications	No limit
Scientific instrumentation for the calibration of medical devices or for the calibration of scientific research instruments	No limit	A laboratory analytical standard	No limit

Scientific instrumentation used as a reference for clinical validation studies	No limit	Scientific instrumentation for measuring the quantity of mercury in the environment	No limit
Dental amalgam	No limit	Radiation and infrared light detector	No limit
Low mercury chloride reference electrode, mercury sulphate reference electrode and mercury oxide reference electrode	No limit	Replacement part for a product, if the product was, prior to the coming into force of the Regulations, manufactured with the part in question or manufactured with the part in question and imported	No limit
Professional, commercial and industrial photographic film	No limit	Professional, commercial and industrial photographic paper	No limit

Source: Environment Canada

It should be noted that while mercury is included in Schedule I of the *Canadian Environmental Protection Act, 1999*, mercury compounds are not yet listed. A separate regulatory process is underway to add mercury compounds to Schedule I of CEPA, 1999, and a notice of intent was published in June 2010 to that effect. Once mercury compounds are added to Schedule 1 of CEPA 1999, the proposed Regulations will apply to batteries which contain mercury compounds.

#### Permits

A permit system would also be implemented to allow for controlled import, manufacture or sale of other mercury-containing products that might be necessary in the future. The Minister would only issue a permit if the following conditions are met: the product plays an important role in the protection of human health or the environment; there is no technically or economically feasible alternative; and there is an end-of-life management plan.

#### Reporting, labelling and testing

The following provisions would apply to mercury-containing products listed on the schedule of the proposed Regulations or for which a permit has been granted:

- product warning labels to provide information on the mercury content of products, and other relevant information;
- annual reports to the minister to document information on the manufacturer/importer as well as product- and substance-specific information; and
- testing and product certification for mercury-containing lamps, to ensure the accuracy of content levels for products contained in the schedule.

#### Background

Mercury is a naturally occurring element. However, in ecosystems it can transform through biological activity into a highly harmful organic substance called methyl mercury, which builds up in living organisms such as in fish through their surrounding environments and is concentrated as it moves up the food chain. Human exposure to methyl mercury can cause brain, nerve, kidney, and lung damage and, in extreme cases, coma or death. Children exposed to methyl mercury while in the womb may experience developmental difficulties such as reduction in intellectual quotient (IQ), delays in walking and talking, lack of coordination, and blindness and seizures. ([see footnote 7](#))

While mercury emissions have declined in Canada, these reductions have not been reflected in lower environmental concentrations. This is due to the persistent nature of mercury and increased industrialization in other countries. Global emissions of mercury were estimated to be more than 5 000 000 kg in 2006 with deposition of mercury in Canada estimated to be roughly 156 000 kg. Canadian sources were responsible for just 1.42% of this deposition. In Canada, each year, excessive mercury contamination of fish tissues has led to the issuance of thousands of recreational fish consumption advisories.

Because mercury tends to accumulate in polar regions, concentrations measured in Canada's Arctic lakes have increased two- to threefold over the past century with levels found in many freshwater fish and lakes surpassing the guidelines for human subsistence or commercial sale. ([see footnote 8](#)) The Canadian inter-departmental Northern Contaminants Program (NCP) found mercury levels have increased 2 to 3 times over the last 25 years in some Arctic seabirds and marine mammals, ([see footnote 9](#)) while the population of Ivory Gulls, a rare marine bird breeding at remote sites in the high Arctic, has declined by 80% since the early 1980s due at least in part to mercury (Ivory Gulls are now listed under the *Species at Risk Act*). The primary route of human mercury exposure is by consumption of fish and fish eating mammals with heightened levels of methyl mercury. Recent research indicates significantly higher levels of mercury in the maternal blood of Inuit women in comparison to other groups (e.g. Caucasian). ([see footnote 10](#))

In recognition of the global nature of mercury pollution, in 2003, the United Nations Environment Programme (UNEP) concluded that there was sufficient evidence of significant global adverse impacts from mercury to warrant further international action to reduce the risks to human health and the environment. UNEP's Governing Council urged all countries to adopt goals and take national actions that target reductions in uses, releases, and exposures including reducing or eliminating the use of mercury in products. ([see footnote 11](#)) At its 25th session, the Governing Council asked UNEP to establish an intergovernmental negotiating committee with the mandate to prepare a legally binding instrument on mercury for 2013. Canada will be a participant in these negotiations.

Canada has used numerous federal statutes to identify and manage most large sources of mercury pollution. ([see footnote 12](#)) These actions control various industrial processes ([see footnote 13](#)) and numerous aspects of mercury production, use, storage, transport and/or disposal. ([see footnote 14](#)) They include the use of regulations, Pollution Prevention Plans (P2 plans) ([see footnote 15](#)) and Canada-wide Standards (CWS) for waste incineration, base metal smelting and coal-fired electric power generation. As a result, from 1990 to 2007, atmospheric emissions of mercury have been reduced from 35 000 kg per year to approximately 7 000 kg. ([see footnote 16](#))

Despite these reductions, the use of mercury in products has remained largely unmanaged. It is estimated that 27% of Canada's atmospheric mercury emissions are now attributable to the use and end-of-life disposal of mercury containing products. Releases of mercury can occur at any stage of a product's lifecycle including manufacturing, use, recycling, and disposal. For example, mercury can be released when mercury-containing products are broken at home or in the workplace, or as they are being transported to and disposed of in landfills.

In 2006, a risk management strategy was published which discussed a range of options for managing new and end-of-life mercury-containing products. This was followed in 2007 by an outline of proposed instruments, including regulations to control the use of mercury in products. The proposed Regulations would proceed from these documents as well as consultations conducted by Environment Canada (EC).

#### *Use profile*

Mercury has many useful properties that have led to its use in a variety of different products. For example, it forms alloys with other metals, conducts electricity, and expands in response to changes in pressure and temperature. While most Canadian manufacturers have eliminated the use of mercury, there are still many products imported into the Canadian marketplace that contain mercury, including the following:

- lamps;
- batteries;
- dental amalgam;
- thermostats;
- switches and relays;
- thermometers;
- other measuring devices; and
- tire balancing products.

In 2008, an estimated 9 400 kg of mercury entered the Canadian marketplace, with more than half (4 700 kg) contained in dental amalgam, the use of which is subject to a pollution prevention plan. Sizable amounts of mercury were also used in lamps (2 000 kg), thermostats (735 kg), switches and relays (597 kg) and batteries (901 kg). ([see footnote 17](#)) Due to the long-term use and life-span of mercury-containing products, it is estimated that 210 000 kg of mercury can be found in products in use in Canadian society, in addition to 286 000 kg of mercury that can be found in products in landfills. ([see footnote 18](#))

## *Sector profile*

The proposed Regulations would potentially impact several subsectors within Canada's manufacturing sector, including those that use elemental mercury as an input within products: the electric lighting and equipment manufacturing industry, and the sign manufacturing industry.

### Electric lighting and equipment manufacturing

Two facilities within the larger electric lighting and equipment manufacturing sector (332 establishments) manufacture fluorescent lamps that contain mercury. However, it is expected that the domestic manufacturing of mercury lamps will decline after 2010, following the closure of one of these facilities in Ontario. Both firms are large multinational corporations with provincial operations in Ontario and Quebec. Production of mercury lamps is export oriented with an estimated 85% of production shipped abroad. About 90% of this production is shipped to the United States. Domestic imports are split between China (44%), and the United States (36%). ([see footnote 19](#))

### Sign manufacturing industry

The production of neon signs in Canada is categorized within the larger sign manufacturing sector. This sector consists of 1 844 establishments throughout Canada with 54% located in Ontario and Quebec. These firms are predominantly micro- and small-sized businesses (1–99 employees) with 51% employing less than 5 workers. ([see footnote 20](#)) It is estimated that 600 of these establishments produce neon signs that contain mercury. In 2008, neon sign manufacturers had estimated sales of \$18 million and produced over 1 million feet of output with production solely for the domestic market.

### Imported products

In 2008, an estimated 500 million mercury-containing products with a value of \$445 million were imported into Canada by 3 419 importers. Lamps (47%) and batteries (44%) accounted for the vast majority of the value of these imports. Mercury products were imported as final goods, as inputs within final goods, and potentially for use as inputs within final goods. For example, lamps are used in automobiles and Liquid Crystal Display (LCD) screens; mercury batteries are used in smoke detectors, watches, toothbrushes, hearing aids and calculators; and switches and relays are used in equipment and appliances such as computers, laboratory equipment, clothes dryers and microwaves. In most cases, it is not possible to track the sale and usage of intermediate inputs to individual firms which makes it difficult to compile detailed information on these manufacturers.

### Retailers

Environment Canada estimates that there are between 25 000 and 35 000 retailers that may sell mercury-containing products in Canada. These retailers include drugstores, hardware stores, dollar stores, heating contractors, and pumps-repair and installation stores.

### Actions in other jurisdictions

#### *United States*

In addition to a federal ban on mercury contained in paints and batteries, 45 states, including large states such as California, Illinois, and New York, have legislation and regulations that range from product labelling legislation to controls on the sale and use of mercury products, to establishing disposal bans and education and collection programs.

In 2006, the United States Environmental Protection Agency (U.S. EPA) announced that it would pursue the reduction of mercury used in products when benefits justify the costs. ([see footnote 21](#)) In November 2008, the U.S. EPA concluded that effective and economically feasible alternatives exist for products such as switches/relays, button-cell batteries, and measuring devices. Based on this conclusion, the U.S. EPA announced it was considering management actions on mercury products under appropriate sections of the *Toxic Substances Control Act*. ([see footnote 22](#))

#### *European Union*

In the European Union there are prohibitions and controls on a wide variety of mercury-containing products, including

- electrical equipment (including fluorescent lamps);

- batteries;
- vehicles;
- thermometers; and
- certain measuring devices, e.g. manometers, and barometers.

Several Scandinavian countries have instituted legislation that exceeds current E.U. legislation. For example,

- Norway has a general prohibition on production, import, export, sale and use of mercury in products;
- Denmark and the Netherlands have prohibited the import, export, and sale of mercury-containing products; and
- Sweden has prohibited the production, import, and sale of mercury-containing thermometers and other measuring equipment, certain switches, relays, and thermostats. ([see footnote 23](#))  
ToxEcology, Jurisdictional Scan for Mercury Containing Products (Environment Canada, 2007).

### ***Regulatory and non-regulatory options considered***

The objective of the risk management strategy for mercury-containing products is to reduce mercury releases to the environment from products to the lowest level possible. Several regulatory and non-regulatory options were considered.

#### Status quo

For most products, the growing popularity of alternatives was expected to result in reductions in mercury use. However, in the absence of risk management, it was thought that Canada could receive products that are prohibited in the European Union and some states within the United States. In particular, an increase in imports of lamps with potentially higher mercury content was forecast given the phase-out of incandescent lamps in Canada. The market for mercury lamps (which accounts for 25% of mercury used in products) is estimated to be growing at a rate of 25% per year as incandescent lamps are phased out, and Natural Resources Canada implements strict energy efficiency requirements for lamps in 2012. There was also a potential under the status quo that newly developed mercury products could enter the Canadian marketplace. A recent example is provided by the introduction of tire balancers in 2000, which contain a relatively high quantity of mercury. As such, the status quo would not achieve the risk management objective and was rejected.

#### Market-based instruments

Market-based instruments were considered as a primary instrument to reduce the mercury content in products. However, these instruments were rejected because of concerns regarding implementation and effectiveness. For example, a tradable unit approach for manufacturers was rejected because of the small number of manufacturers and the large number of imported products, making it difficult to set up a trading system.

A tax on mercury-containing products would provide a financial disincentive at the point of purchase and reduce demand. However, environmental taxes may not offer certainty in terms of meeting target reduction quantities. Furthermore, a tax structure would be difficult to develop given that it requires a high level of information and data (e.g. mercury levels in each product). For the same reasons, financial incentives and subsidies to encourage production and purchase of mercury-free alternatives were ruled out.

#### Pollution prevention plans

Pollution prevention plans (P2 plans) have been successfully applied to control mercury releases from individual sectors such as base metal smelters, refineries and zinc plants, and the recycling of mercury switches in automobiles. P2 plans have also been selected to control waste from the use of dental amalgam. While these tools are effective within individual sectors, the large number of imported products could create a large administrative burden on the Government if all importers were required to submit P2 plans.

#### Voluntary tools

Voluntary tools and initiatives like the Canada-wide Standards (CWS) on mercury lamps were successfully applied to achieve reductions in domestically manufactured lamps. However, controlling mercury used in products in Canada with voluntary tools is difficult because of the vast number of imports which arrive each year. For example, under the CWS, members of the Canadian association for the lamp

industry have reduced the average mercury content in lamps of all kinds sold in Canada from 43 mg to 7.9 mg from 1990 to 2006. While this represents a significant reduction, it does not prevent imported lamps with higher mercury content. It was therefore decided that voluntary tools cannot address the broader problem of imported goods, which could result in free rider issues and an unfair playing field for the domestic industry.

### Extended producer responsibility

Extended Producer Responsibility (EPR) programs could be used to collect mercury-containing products at the end-of-life and contribute to reduced releases from landfills and incinerators. As discussed, there is a large reservoir of mercury products in Canadian society with products exiting each year to the waste stream. EPR would be ideally suited as a complementary tool to address the legacy of mercury products in homes and workplaces. EPR programs were not chosen as a primary instrument because they cannot be used to prevent releases that occur throughout the entire lifecycle, they may not be financially feasible for products which are not used in large numbers, and may not capture all products that enter the waste stream. However, Environment Canada recognizes that EPR programs could be an effective tool to encourage the recycling of lamps in Canada.

### Regulations respecting substances in Schedule 1 of CEPA 1999

Regulations respecting substances in Schedule 1 of CEPA 1999 (section 93) offered a comprehensive approach to managing mercury uses and emissions. In recognition of the risk management objective, a regulatory approach covering all products was selected as the primary instrument to effectively minimize the mercury entering Canada's marketplace. This approach could minimize releases from both domestically produced and imported products and reduce the number of mercury products that enter the waste stream. It would be complementary to future EPR programs to collect products such as lamps at the end-of-life.

### ***Benefits and cost***

#### Summary of benefits and costs

From 2012 to 2032, the proposed Regulations are expected to reduce the use of mercury in products by roughly 90 000 kg (41%). Releases of mercury from products to the environment would decrease by 54 000 kg (27%) including about 10 000 fewer kilograms of mercury released to air. Since mercury in the atmosphere travels globally, the benefits would accrue to Canadians and the global community. There is also a range of health and environmental benefits that were not monetized, including improved ecological quality, improved health of wildlife, and reduced exposures for Canadians.

The total discounted costs of the proposed Regulations are estimated to be roughly \$10.1 million over 20 years, of which, \$4.2 million would be incurred by the federal government for compliance promotion and enforcement and \$5.9 million to importers for the increased cost of mercury-free alternative products. These costs to importers would likely be passed down to consumers.

#### Approach

An analysis of the incremental benefits and costs was conducted using a baseline and regulated scenario. To forecast the impact of the proposed Regulations, a study was conducted for Environment Canada to project the use of mercury in products from 2012, the first year of implementation, to 2032 using trend analysis, and input from industry. ([see footnote 24](#)) Releases of mercury from products were estimated by Environment Canada utilizing a mass balance framework that estimated the flow of mercury associated with products from production/import and use through to ultimate disposal.

These projections are based upon the estimated annual input of mercury, the estimated annual output from the in-service reservoir, and the fate of mercury throughout each product's unique lifecycle. When possible, costs and benefits have been estimated, monetized and expressed in 2009 Canadian dollars. A discount rate of 8% is used when figures are expressed in present value terms. When restricted by a lack of appropriate data or challenges in valuation, the costs and benefits have been described in qualitative terms.

#### Baseline scenario

The baseline scenario is based upon estimates for mercury uses in each product type. For products with well-established mercury-free alternatives, sales are expected to decline irrespective of overall market growth (e.g. thermostats and thermometers). For products that currently require mercury (e.g. fluorescent lamps), market growth is expected to have an important impact upon the overall use of mercury. Under the

baseline scenario, the use of mercury in many products is expected to decline; however, the growth in sales of lamps and tire balancers is expected to offset these reductions. In the absence of the proposed Regulations, the use of mercury in products is expected to increase per annum from about 9 700 kg in 2012 to 11 100 kg in 2032. These estimates may underestimate the quantity of mercury used in products as they preclude the development of new products into the Canadian marketplace and assume that domestic and imported lamps contain the same quantity of mercury.

### Regulated scenario

Under the regulated scenario, the manufacture, import, and sale of products containing mercury are prohibited with certain exemptions identified in Table 1. The regulated scenario takes into account these exemptions, including reduced mercury levels in lamps over the 20-year timeline. The use of mercury in products that are not exempt is assumed to be eliminated beginning in 2012.

An estimated reduction of about 90 000 kg (41%) of mercury used in products is expected over the first 20 years of implementation. In 2012, around 3 500 fewer kilograms of mercury is expected to enter the Canadian marketplace growing to over 4 800 kg by 2032 (See Table 2). These reductions would be complemented by other mercury management initiatives under development.

Table 2: Impact of Proposed Regulations on Mercury Entering the Canadian Marketplace in Products (kilograms)

	<b>Business as usual</b>	<b>Proposed Regulations</b>	<b>Annual difference</b>	<b>Cumulative difference</b>
<b>2011</b>	9 517	9 517	—	—
<b>2012</b>	9 681	6 162	3 519	3 519
<b>2022</b>	10 557	6 242	4 315	44 104
<b>2032</b>	11 134	6 316	4 818	89 794

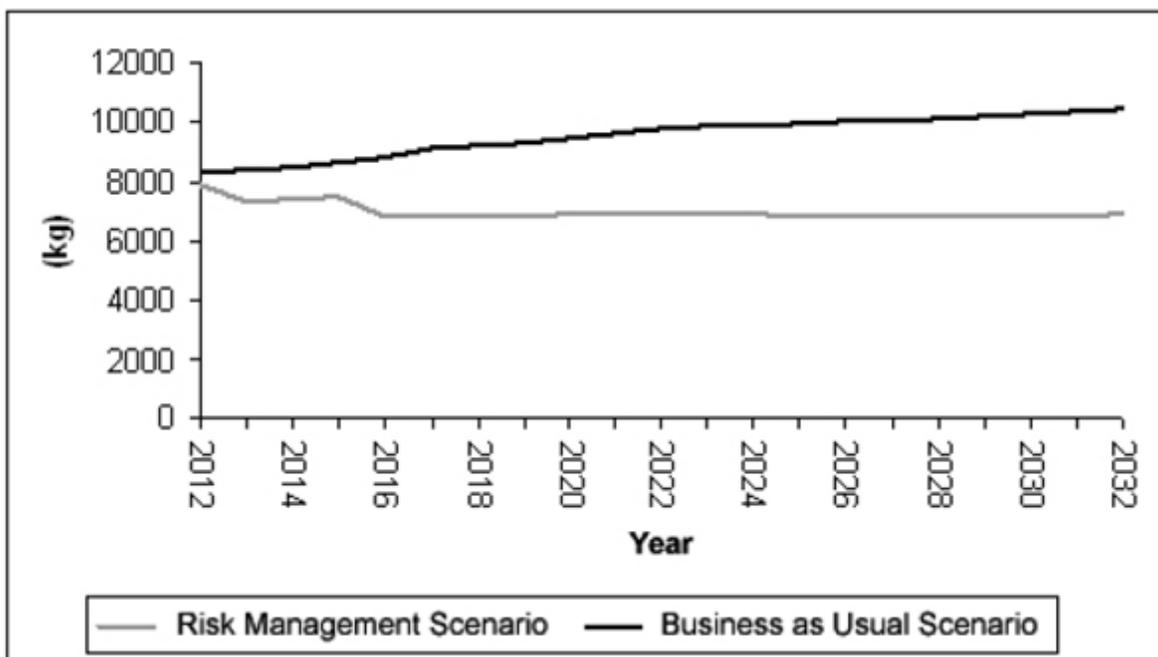
Source: Environment Canada

### Benefits

#### *Release reductions*

A reduction of about 90 000 kg of mercury entering the marketplace over 20 years would reduce the mercury that enters Canada's air, water, and soil. Figure 1 shows the estimated impact of the proposed Regulations on mercury releases to land, air, and water versus the baseline scenario.

Figure 1: Impact of proposed Regulations on releases to the environment of mercury from products, per annum, in Canada (kilograms)



Source: Environment Canada

In 2012, the estimated release reduction is 400 kg per year (Figure 1) which would increase to 3 600 kg in 2032 as the existing stock of mercury products is retired. From 2012 to 2032, the cumulative reduction is estimated to be about 54 000 kg, a reduction of 27% relative to the baseline scenario. As with the use of mercury in products, Environment Canada expects to manage the remaining releases.

This sum of avoided releases can be broken down further between releases to land (82% — 46 315 kg), to air (18% — 9 991 kg) and water (0.2% — 123 kg). Most of the mercury that is released to land from products is assumed to go to the landfill where a small percentage each year will leach to water or emit to air as landfill gas.

Mercury emitted to air can cycle through the atmosphere and may deposit in aquatic and terrestrial ecosystems, with harmful impacts upon environmental quality. The proposed Regulations would reduce the annual release of mercury from products to air by 6% (95 kg) in 2012 and by 36% (721 kg) by 2032. The cumulative reductions to the air would be 9 991 kg representing a reduction of 27% compared to the baseline scenario. To put these numbers into perspective, product releases to air in 2007, as reported to the National Pollutant Release Inventory (NPRI), were roughly 1 908 kg which represented 27% of total mercury releases to air in Canada.

#### *Environmental benefits*

The benefits are discussed qualitatively as the endpoints have yet to be studied and quantified in a manner that is suitable for a cost-benefit analysis (e.g. exposure-response functions need to be established). In qualitative terms, the proposed Regulations would have minor benefits for Canadian wildlife and ecosystems as mercury is known to impair reproduction potential in some wild populations of fish and birds, and have neurochemical effects for fish-eating animals. Some of these benefits would be realized globally as roughly two-thirds of Canada's mercury emissions to air deposit internationally.

It is estimated that products used in Canada represent less than one percent of actual domestic deposition of mercury. However, any amount of mercury released to the environment has hazardous potential. For example, the quantity of mercury in a typical thermometer (as much as 3 g) diluted completely and evenly in a body of water could contaminate up to 11.5 million litres beyond limits set for the protection of aquatic life by the Canadian Council of Ministers of the Environment (26 ng per litre of freshwater). This would be equivalent to five Olympic-sized swimming pools. Local releases of mercury from landfill sites would also be avoided, thus preventing these discharges of mercury to the Canadian environment.

Finally, over half of global mercury pollution is caused by coal combustion and two-thirds of global emissions originate in Asia. Canada's action on products and participation in international initiatives that

seek to reduce global mercury pollution could potentially yield considerable benefits for Canada's environment.

### Health

#### Dietary exposure

Internationally, researchers have studied the ingestion of mercury-contaminated food by expecting mothers and linked the resulting IQ changes in children with future lost earnings and education. [\(see footnote 25\)](#) These studies suggest that large economic benefits can be realized by reducing mercury pollution. As an example, in the Regulatory Impact Analysis of the *Clean Air Mercury Rule* (2005) the U.S. EPA assessed the costs of prenatal mercury exposure from the consumption of recreationally caught freshwater fish. The U.S. EPA found that the benefits of eliminating mercury emissions from U.S. power plants would be roughly US\$210 million per year. [\(see footnote 26\)](#)

Further, Spadero and Rabyl (2008) estimate a global average of the marginal damage cost of mercury at roughly US\$1,500 per kilogram emitted if one assumes a dose threshold level of 6.6 µg of methyl mercury per day. [\(see footnote 27\)](#) In a report to the Nordic Council of Ministers, Sundseth et al. use this value (US\$1,500 per kilogram) to calculate that the global damage costs of methyl mercury ingestion will be approximately US\$10 billion by 2020 in the absence of further risk management actions. [\(see footnote 28\)](#)

Within the Canadian context, monetizing with confidence the health benefits of reduced mercury emissions is challenging and the expected benefits would likely be small compared to the benefits that could be realized by greater global action. For example, inhabitants of Northern Canada experience the highest risk of elevated mercury exposure because of the traditional diets that consist of large quantities of fish and marine mammals. [\(see footnote 29\)](#) However products used in Canada represent less than 0.01% of deposition in this region. [\(see footnote 30\)](#) The proposed Regulations would help Canada promote global reductions alongside other leading economies such as the United States and the European Union.

#### Direct exposure from products

The proposed Regulations would contribute towards the health and safety of Canadians by prohibiting or limiting mercury in products. Mercury exposures can occur in the home and workplace as a result of products being misused or broken. While Health Canada does not collect data on such incidences, it recognizes the potential and warns against the dangers. [\(see footnote 31\)](#) Using the mass-balance framework developed for Environment Canada, Table 3 shows the estimated impact on releases assumed to occur during consumer use.

Table 3: Mercury Releases from Product Breakage and Spilling, 2012–2032 (kilograms)

Product	Total Reduced (air)	Total Reduced (wastewater)
Fluorescent lamps	424	424
Non-fluorescent lamps	28	17
Thermometers		131
Thermostats	41	166
Measuring and control devices	8	4
Switches and relays	23	49
	<b>524</b>	<b>791</b>

Source: Environment Canada

Exposures may also occur during the manufacturing of fluorescent lamps. Assuming that the remaining facility maintains its 2008 production levels, the proposed Regulations are estimated to result in annual reductions of 14.4 kg per year in the workplace and 302 kg over the 20-year timeline.

## Costs

### *Cost to manufacturers*

The proposed Regulations would prohibit the manufacturing of mercury-containing products in Canada, and assign content limits for lamps and neon signs. The lamp sector is not expected to be burdened by the proposed content limits. The sector has voluntarily reduced the average mercury content per lamp ([see footnote 32](#)) and exports to jurisdictions with similarly strict content limits (e.g. certain U.S. states and the European Union). Additional investments in capital or reformulation should not be necessary.

In terms of neon signs, the content levels were established following consultations. The industry association informed Environment Canada that the proposed content limits are achievable by implementing best practices and members are working towards compliance for 2012. ([see footnote 33](#)) Compliance is not expected to require incremental investments in capital or reformulation.

Some firms in Canada potentially import mercury-containing inputs (e.g. lamps, switches and relays, and batteries) in the production of final goods. The proposed Regulations could impact firms that use button cell batteries as an input (e.g. in wristwatches, hearing aids, and calculators). ([see footnote 34](#)) However, Environment Canada conducted a targeted mail-out to stakeholders including relevant industry associations and is not aware of any manufacturers or sectors which would be burdened by incorporating mercury-free button cells in their products. Mercury-free alternatives are expected to be available in the U.S. market for all varieties of button cells for 2011 with the exception of certain niche products (e.g. specialty watches). ([see footnote 35](#))

### *Cost to importers*

Importers of mercury products are not expected to be significantly impacted by the proposed Regulations. In most cases, these importers are able to purchase mercury-free products that are technically feasible and comparably priced. Nevertheless, there are a few mercury-free alternatives that are relatively more expensive.

Mercury-free digital thermometers cost at least 30% more than mercury thermometers. In 2008, close to 50 000 thermometers (average price of \$20) were imported into Canada with a total value of almost \$1 million. The incremental cost (present value) to importers would be \$3.7 million over 20 years. ([see footnote 36](#)) This is a maximum cost, as consumers could buy liquid thermometers that are relatively cheaper but offer inferior performance.

Mercury-free button-cell batteries traditionally cost 24% to 30% more than mercury varieties. However, some mercury-free button-cell varieties are now available in the U.S. states at a comparable price. ([see footnote 37](#)) The aggregate cost for remaining varieties would be roughly \$2.2 million in the first year of implementation. ([see footnote 38](#)) Given that U.S. battery manufacturers have committed to phasing out production of mercury varieties for 2011, ([see footnote 39](#)) this analysis assumes that these costs are negated by 2013 due to market expansion, increased competition, and economies of scale.

### *Administrative costs*

For products that will still be allowed (by permit or exemption) to contain a limited amount of mercury, there would be administrative costs for permit application, testing, labelling, record keeping and reporting. To a large extent, these requirements would have little incremental impact on domestic manufacturers as these firms are in compliance with a range of testing and labelling requirements in the United States. ([see footnote 40](#)) The permitting requirements should be limited to few importers. Record-keeping provisions allow Environment Canada to maintain a current record of mercury used in products, allow Canada to report on the performance of the Regulations and inform potential future risk management actions. As the reports may be retained and sent to the Minister electronically, the burden of physical storage and maintenance would be avoided.

### *Cost to consumers*

It is likely that importers would pass on some or all of the incremental costs discussed above to

consumers. In the case of thermometers, this cost would be offset by the improved performance of digital thermometers (higher accuracy and less time to take a reading). For mercury button-cell batteries, which are sold individually or within products such as toys, watches and hearing aids, the imported prices range from roughly \$0.60 to near \$2. In most cases, the incremental price increase and/or the impact on the price of the final good would be small and in the long run these costs are expected to be eliminated.

#### *Cost to Government*

The federal government would incur incremental costs related to training, inspections, investigations, and measures to deal with any alleged violations, and compliance and promotion activities.

With respect to enforcement costs, a one-time amount of \$75,000 will be required for the training of enforcement officers.

The annual enforcement costs are estimated to be about \$407,000 broken down as follows: roughly \$350,000 for inspections (which includes operations and maintenance costs, transportation costs and sampling costs), \$29,000 for investigations, \$10,000 for measures to deal with alleged violations (including warnings, environmental protection compliance orders and injunctions) and about \$18,000 for prosecutions.

Over the 20-year timeline utilized by this analysis, the total discounted costs for the federal government related to enforcement are expected to be roughly \$3.6 million.

Compliance and promotion costs would require a budget of about \$333,000 in the first year of implementation and decrease each year to roughly \$38,000 by year 4. The present value of total compliance costs over the 20-year period is estimated to be \$582,000.

In total, the present value of the enforcement and compliance and promotion costs over the 20-year period is estimated to be \$4.2 million.

#### Competitiveness

The proposed Regulations are not expected to harm the competitiveness of Canada's lamp manufacturers within the domestic market as the proposed Regulations would ensure that imported lamps are subject to the same content limits. The impact upon U.S. manufacturers that export goods to Canada should be minimal as many U.S. manufacturers have taken voluntary action to eliminate or reduce mercury used in products. For example, lamp manufacturers in the United States have voluntarily reduced the mercury content to an average of 4 mg per lamp, ([see footnote 41](#)) while the U.S. battery industry committed in 2006 to eliminate mercury from button-cell batteries by June 30, 2011. ([see footnote 42](#))

#### Conclusion

The present value of quantified costs, accumulated benefits, and qualitative costs and benefits of the proposed Regulations are summarized below.

Table 4: Cost-benefit Statement

<b>A. Quantified costs (present value \$)</b>	
Government	\$4.2 million
Increased cost of mercury-free thermometers (maximum) to importers	Up to \$3.7 million
Increased cost of mercury-free batteries to importers	Up to \$2.2 million
<b>Total quantified costs</b>	<b>Up to \$10.1 million</b>

<b>B. Quantified environmental benefits (cumulative)</b>	
Reduced input of mercury used in products	89 794 kg
Reduction in mercury releases from products to the environment	53 578 kg
Reduction in mercury releases from products released to air	9 991 kg
<b>C. Quantified health benefits (cumulative)</b>	
Reduction of mercury releases to air during domestic manufacturing	302 kg
Reduction of consumer releases of mercury to air	524 kg
Reduction of consumer releases of mercury to water	791 kg
<b>D. Qualitative benefits and costs</b>	
Benefits	
Benefits for the environment	There would be benefits for wildlife and ecosystems commensurate with the reduction of mercury in products in Canada. Mercury impairs reproduction potential in some species of fish and birds and has neurological impacts on fish-eating animals.
Benefits for the health of Canadians	Mercury exposure in humans is known to cause damage to the brain, lungs, nerves, and kidneys. The Regulations would limit mercury exposures from products.
Benefits for Canada	Controlling the use of mercury in products allows Canada to join other leading jurisdictions and encourage measures to reduce releases at the upcoming UNEP negotiations. Mercury reductions from other countries can yield significant benefits for Canadians
Benefits for the international community	Much of Canada's mercury emitted to air is assumed to deposit outside Canada's borders. The proposed Regulations would reduce Canada's contributions to the global mercury pool and

	help reduce the approximately \$10 billion dollars in annual global damage costs from methyl mercury anticipated to occur by 2020.
Level playing field for Canada's lamp manufacturers	Domestic and imported lamps would be subject to the same content levels.
Costs	
Administrative costs for manufacturers and importers related to testing, labelling, reporting, and permits.	These costs are expected to be minimal.

### **Rationale**

Mercury is listed in Schedule 1 of the *Canadian Environmental Protection Act, 1999*.

Mercury is a persistent, neurological toxicant present in the environment in sufficient quantity to threaten the health and environment of Canadians. While some mercury in the Canadian environment is the result of domestic activity, the majority arrives from foreign sources, highlighting the global nature of mercury pollution. Canada's ability to influence and encourage reductions from its international partners will depend, in part, upon the integrity of its position and the ability to address domestic sources of mercury release.

Canada has achieved large reductions in mercury pollution from industrial sources. However, the use and release of mercury in products has gone largely unmanaged despite representing 27% of Canada's atmospheric emissions. Further inaction could leave Canada vulnerable to increased imports of mercury products such as compact fluorescent lamps and potential future applications. Given the international consensus on mercury's danger to human health and the environment, Canada has decided to pursue additional regulatory initiatives that address the remaining domestic sources of mercury pollution including the entire lifecycle of mercury containing products.

To ensure a reduction of releases relative to the status quo, a regulatory approach was selected to prohibit (with a few exemptions) the manufacture, import, and sale of mercury products. The proposed Regulations would allow Canada to control the import of products that account for the vast majority of use and release and help re-assure Canadians that products are free of mercury or contain the lowest levels possible. Canadians would also benefit from mandatory labelling provisions that identify the presence of mercury and educate on proper use and disposal. Finally, the proposed Regulations would prevent future applications of mercury in products unless this use was essential. To complement the proposed Regulations, future EPR programs could collect and take back products in the existing reservoir and products whose use continues to be permitted (e.g. lamps).

The costs of the proposed Regulations would be incurred by governments and importers with some costs passed on to consumers. These costs would result in a present value cost of up to \$10.1 million. Concurrently, there would be quantified reductions over the first 20 years of implementation including about 90 000 fewer kilograms of mercury entering the marketplace, 54 000 fewer kilograms of mercury released to the environment and about 10 000 fewer kilograms of mercury released to air. While these reductions are not monetized within the Canadian context, the benefits of the proposed Regulations are expected to be significantly greater than the costs given \$10 billion dollars in annual global damage costs anticipated to arise by 2020 in the absence of action by the international community.

The proposed Regulations were developed in consultation with industry, provincial and territorial governments, environmental non-governmental organizations and other government departments. The proposed Regulations are consistent with a variety of measures found in U.S. states and in the European Union. The proposed Regulations enable Canada to contribute towards the numerous mercury-related international initiatives to which it is a party. Given that large quantities of mercury deposited in the Canadian environment arrive from foreign sources, Canada's continued actions to reduce mercury emissions where appropriate can encourage and influence foreign jurisdictions to take similar measures

which will realize benefits for all Canadians.

### ***Consultation***

Two rounds of national consultations were held with industry, government, and environmental non-government organizations in 2007 and 2008. (see footnote 43) Generally, these groups were supportive of risk management measures for some or all mercury containing products. A targeted mailout was conducted in 2009 to remaining stakeholders. Additional consultations were held with representatives from the neon sign industry to assess the subsector's ability to achieve the proposed content limits. In addition, Environment Canada has consulted and shared information with the U.S. EPA through various forums.

### Consultation sessions

In 2008, Environment Canada hosted multi-party consultation sessions in Toronto and Vancouver to discuss tools and instruments for prohibiting or limiting mercury use in products, controlling imports or exports, and setting labelling requirements. The consultation document was sent to over 500 stakeholders for comments. Those that attended the consultation sessions and/or submitted written comments included stakeholders from industry, industry associations, government departments, and environmental and health organizations. A total of 33 participants representing various stakeholder groups took part in the consultation sessions.

Environment Canada received comments on the following provisions of the Regulations:

#### *Prohibition of mercury containing products*

While participants generally endorsed the management of some or all mercury-containing products in Canada, it was questioned whether life-cycle analyses supported a broad prohibition. It was suggested that lamps, for example, could continue to be managed using a voluntary approach, given the success of domestic industry in reducing the mercury content in lamps.

Environment Canada argued that life-cycle analyses demonstrate that releases may occur during all stages of a product's life, and atmospheric emissions from products are in the order of 1 626 kg a year. Prohibition is therefore an efficient means to limit releases from new products. In terms of lamps, Environment Canada recognized that while commendable progress was made by Canadian manufacturers in voluntarily achieving the targets under the CWS for Mercury containing lamps, there is a need to achieve reduced mercury levels in all lamps (i.e. imports) sold in Canada.

Some participants raised the possibility that the use of mercury-containing products, particularly products other than dental amalgam and compact fluorescent lamps, would continue to decline and disappear over time without the need for a prohibition.

Environment Canada's position is that the relatively low price of mercury and the increasing surplus in the marketplace — coupled with mercury's useful technical properties — provides an increasing economic incentive for companies to preserve their current uses of mercury and could potentially result in mercury being used in new products.

#### *Exemptions*

Participants' opinions differed on whether specific products should be exempted from the prohibitions. Some participants felt no exemptions were needed, while others felt that exemptions were appropriate for dental amalgam and lamps, as long as a life-cycle approach was taken and end-of-life measures were introduced. Others felt that end-of-life management should be an interim strategy until all products are eliminated and that a phase-out period for certain products would be useful. Finally, importers of products that contain mercury inputs requested the availability of exemptions if mercury-free alternatives are not substitutable. Exemptions were also requested for the sale and labelling of mercury products to be integrated as a component of a larger product, when that product was manufactured before the coming-into-force of the Regulations.

Environment Canada responded that exemptions would be available when a lack of viable alternatives exists and the need for continued use of these products in Canada can be demonstrated. The overall approach would include developing end-of-life measures for any exempt products. Exemptions under the prohibition would also be subject to periodic review, based on innovations in the research and development of alternatives. The proposed Regulations would also exempt some mercury products when they are to be integrated into larger products that were manufactured before 2012.

Stakeholders felt that separate content limits may be required for different lamp applications if lamps were exempted from prohibition under the Regulations.

Environment Canada recognized that the same mercury content would not be applicable for all lamps and therefore agreed to explore the possibility of mandating separate content limits. The proposed Regulations have incorporated these concerns (see Table 1).

### *Labelling*

In terms of labelling, participants from industry were focused on the specific nature of the requirements. Among the identified considerations was the need to minimize text given limited space, easy-to-read labels that encompass mercury content, and disposal information and the health risks of products, particularly for sensitive populations.

Environment Canada responded that labelling requirements would take practicality and ease of reading into account. Environment Canada will, to the extent possible, work with stakeholders and relevant government departments such as Natural Resources Canada when product size and other labelling requirements are an issue.

### *Manufacturers*

Environment Canada conducted a targeted mail-out to stakeholders (including relevant industry associations) who may be impacted by the proposed Regulations due to their use of mercury inputs such as batteries. At this time Environment Canada is not aware of any manufacturers or sectors that would be burdened by the cost or the applicability of incorporating mercury-free alternatives into their products. However, Environment Canada would specifically like to encourage comments from industry on the impact of the prohibition on button-cell batteries.

## ***Implementation, enforcement and service standards***

### Implementation

For the purpose of implementing the regulatory requirements, Environment Canada will undertake a number of compliance promotion activities. These activities will be targeted toward raising awareness and encouraging the regulated community to achieve a high level of overall compliance as early as possible during the regulatory implementation process. This will include the following:

- Developing and distributing basic compliance promotion material (including explanatory notes) nationally to regulatees and stakeholders;
- Focusing on those regulatees who will be most impacted by the Regulations within the first few years to provide an awareness of the Regulations and educating regulatees regarding the specific requirements of the Regulations such as product prohibitions, exemptions and labelling requirements;
- Upon request, distributing additional information, industry-specific information or focussed information regionally in a tailored approach at a later time; and
- Training Environment Canada compliance promotion staff in a comprehensive manner to respond to regulatees' technical or regulatory questions.

The coordination and implementation of compliance promotion activities will be completed through the National Performance Promotion Working Group on Wastes and Mercury (NPPWG), an Environment Canada Headquarters and regional offices working group. Environment Canada will consider opportunities for the coordination of compliance promotion activities with other regulations under CEPA 1999 which may have similar regulated activities, regulatees and compliance promotion approaches.

Coordination and cooperation opportunities also exist to partner with organizations outside Environment Canada to perform compliance promotion activities such as identifying regulatees and delivering the key messages. These may include

- other government departments, such as Health Canada and Natural Resources Canada;
- other levels of government, such as provinces and territories; and
- industry associations.

Compliance promotion activities will be revisited from time to time to ensure that the Regulations are implemented in the most effective and efficient manner.

## Enforcement

Since the Regulations are made under CEPA 1999, enforcement officers will, when detecting compliance with the Regulations, apply the Compliance and Enforcement Policy for CEPA 1999. The policy sets out the range of possible responses to alleged violations: warnings, directions, environmental protection compliance orders, ticketing, ministerial orders, injunctions, prosecution, and environmental protection alternative measures (which are an alternative to a court trial after the laying of charges for a CEPA 1999 violation). In addition, the policy explains when Environment Canada will resort to civil suits by the Crown for costs recovery.

When, following an inspection or an investigation, an enforcement officer discovers an alleged violation, the officer will choose the appropriate enforcement action based on the following factors:

- Nature of the alleged violation: This includes consideration of the damage, the intent of the alleged violator, whether it is a repeat violation, and whether an attempt has been made to conceal information or otherwise subvert the objectives and requirements of the Act;
- Effectiveness in achieving the desired result with the alleged violator: The desired result is compliance within the shortest possible time and with no further repetition of the violation. Factors to be considered include the violator's history of compliance with the Act, willingness to cooperate with enforcement officers, and evidence of corrective action already taken; and
- Consistency: Enforcement officers will consider how similar situations have been handled in determining the measures to be taken to enforce the Act.

Environment Canada will monitor and review the prohibition of mercury-containing products as necessary to determine whether further actions may be required to achieve the objectives of the Regulations.

## Service standards

The proposed Regulations include the possibility to request permits for products that play an important role in the protection of the environment or human health, if the conditions specified in the Regulations are met. Permit applications are to be submitted to the Minister after the Regulations come into force. The applications for permits will be reviewed by Environment Canada. The administrative procedure may take up to 90 working days. Environment Canada will make every effort to respond quickly to permits applications. The administrative process will include the following:

- Permits applications are stamped with date on which they are received;
- Applications are reviewed to ensure all necessary and required information has been provided; and
- Follow-up with company to inform that permits applications have been received and to request additional information if needed.

Compliance with the service standards for processing permits applications will be monitored and evaluated as part of the regulatory evaluation.

## ***Performance measurement and evaluation***

Environment Canada would monitor the use of mercury in Canada through the mandatory reporting requirements on those subject to the Regulations, as well as Canada Border Services Agency data on the import of mercury into Canada. This would provide an indicator of success as well as a means to gauge the necessity of further action.

The Regulations would be administered by Environment Canada's Waste Reduction and Management Program. The performance and effectiveness of the Regulations would be summarized and reported on annually using data sources such as permits, regulatory reporting requirements, interim progress reports, and monitoring procedures. These data sources would provide Environment Canada with the necessary performance information to measure progress towards outcomes. Progress, performance, and overall effectiveness would be reported on through a variety of means including the CEPA 1999 annual report and departmental performance reports.

Further evaluation of the Regulations would occur as part of the program evaluation for risk management of chemicals under the Chemicals Management Plan.

## ***Contacts***

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### PROPOSED REGULATORY TEXT

Notice is hereby given, pursuant to subsection 332(1) ([see footnote a](#)) of the *Canadian Environmental Protection Act, 1999* ([see footnote b](#)), that the Governor in Council, pursuant to subsection 93(1) of that Act, proposes to make the annexed *Regulations Respecting Products Containing Certain Substances Listed in Schedule 1 to the Canadian Environmental Protection Act, 1999*.

Any person may, within 75 days after the date of publication of this notice, file with the Minister of the Environment comments with respect to the proposed Regulations or, within 60 days after the date of publication of this notice, file with that Minister a notice of objection requesting that a board of review be established under section 333 of that Act and stating the reasons for the objection. All comments and notices must cite the *Canada Gazette*, Part I, and the date of publication of this notice, and be addressed to the Director, Waste Reduction and Management Division, Department of the Environment, Gatineau, Quebec K1A 0H3.

A person who provides information to the Minister of the Environment may submit with the information a request for confidentiality under section 313 of that Act.

Ottawa, February 10, 2011

JURICA ČAPKUN  
*Assistant Clerk of the Privy Council*

### REGULATIONS RESPECTING PRODUCTS CONTAINING CERTAIN SUBSTANCES LISTED IN SCHEDULE 1 TO THE CANADIAN ENVIRONMENTAL PROTECTION ACT, 1999

#### APPLICATION

##### Application

1. Subject to section 2, these Regulations apply to any product that contains a substance set out in column 1 of the schedule.

##### Non-application

2. These Regulations do not apply to the following products:

- (a) waste;
- (b) a product that is at the end of its useful life and that is intended to be recycled;
- (c) a drug as defined in section 2 of the *Food and Drugs Act*;
- (d) a veterinary biologic as defined in subsection 2(1) of the *Health of Animals Act*;
- (e) ammunition and explosives under the direction or control of the Minister of National Defence; and
- (f) a product that contains a substance set out in column 1 of the schedule if that substance is only

incidentally present.

## PROHIBITIONS

### Manufacture or import

3. (1) A person must not manufacture or import any product that contains a substance set out in column 1 of the schedule unless

(a) the product is set out in column 2 of the schedule and the quantity of the substance contained in the product is less than or equal to the quantity set out in column 3; or

(b) the person that manufactures or imports the product holds a permit issued under subsection 5(1).

### Sell or offer for sale

(2) A person must not sell or offer for sale any product that contains a substance set out in column 1 of the schedule unless

(a) the product is set out in column 2 of the schedule and the quantity of the substance contained in the product is less than or equal to the quantity set out in column 3;

(b) the product was manufactured or imported under a permit issued under subsection 5(1); or

(c) the product was manufactured or imported before the coming into force of these Regulations.

## PERMITS

### APPLICATION

#### Requirement for permit

4. (1) Any person that manufactures or imports a product that contains a substance set out in column 1 of the schedule, other than a product set out in column 2, must hold a permit issued under subsection 5(1) in order to carry out that activity.

#### Required information

(2) An application for a permit must be submitted to the Minister in accordance with section 14 and must contain the following information and documents:

(a) respecting the applicant,

(i) their name, civic and postal addresses, telephone number and, if any, fax number and email address, and

(ii) if applicable, the name, title, civic and postal addresses, telephone number and, if any, fax number and email address of their duly authorized representative;

(b) respecting the product,

(i) its common or generic name, and its trade name, if any,

(ii) the quantity of the substance set out in column 1 of the schedule that is contained in the product, expressed in milligrams,

(iii) the estimated quantity to be manufactured or imported by the applicant in a calendar year, and

(iv) the identification and description of each proposed use;

(c) evidence that the product plays an important role in the protection of the environment or human health;

(d) evidence that, at the time of the application, there is no technically or economically feasible alternative to or substitute for the product;

(e) a copy of a plan that identifies and describes the measures the applicant will take to minimize or

eliminate any harmful effect of the substance set out in column 1 of the schedule on the environment and human health, including measures to ensure that that substance is handled safely and is not released into the environment during normal use of the product and at the end of its useful life;

(f) a statement that the plan is to be fully implemented within 30 days after the day on which the permit is issued; and

(g) the civic and postal addresses of the location where the information and supporting documents and the certification referred to in subsection 14(3) are kept.

#### Additional information

(3) The Minister may, on receiving the application, require the submission of any additional information that pertains to the information contained in the application and that is necessary for the Minister to process the application.

### CONDITIONS OF ISSUANCE

#### Issuance

5. (1) Subject to subsection (2), the Minister must issue the permit if the following conditions are met:

(a) the applicant has established that the product plays an important role in the protection of the environment or human health;

(b) the applicant has established that, at the time of the application, there was no technically or economically feasible alternative to or substitute for the product; and

(c) the applicant has prepared the plan referred to in paragraph 4(2)(e), and that plan sets out measures that can reasonably be regarded as measures that will minimize or eliminate any harmful effect of the substance set out in column 1 of the schedule on the environment and human health.

#### Refusal

(2) The Minister must refuse to issue a permit if

(a) the Minister has reasonable grounds to believe that the applicant has provided false or misleading information in support of their application; or

(b) the information required under subsection 4(2) or (3) has not been provided or is insufficient to enable the Minister to process the application.

#### Expiry

(3) A permit expires three years after the day on which it is issued, unless it is renewed in accordance with subsection 6(2).

#### Renewal of permit — application

6. (1) In order to have a permit renewed, a permit holder must submit to the Minister a renewal application, in accordance with subsection 4(2), at least 90 days before the day on which the permit expires and must include the number of the permit in that renewal application.

#### Renewal

(2) The Minister must renew the permit if the conditions in subsection 5(1) are met.

### REVOCATION

#### Grounds for revocation

7. (1) The Minister must revoke a permit if the Minister has reasonable grounds to believe that the permit holder has provided false or misleading information.

#### Conditions for revocation

(2) The Minister must not revoke a permit unless the Minister has provided the permit holder with

(a) the reasons for the revocation in writing; and

(b) an opportunity to make written representations in respect of the revocation.

## LABELLING

Label — products containing mercury or any mercury compound

**8.** (1) Subject to subsection (3), any person that manufactures, imports, sells or offers for sale a product that contains mercury or any mercury compound must indicate the following information in a readily visible location on the product and, if applicable, on the package in which the product is sold or offered for sale, by means of a stamp, label or other mark:

(a) the statement “Caution: contains mercury / Mise en garde : contient du mercure” or “Caution: contains mercury compounds / Mise en garde : contient des composés de mercure”, as the case may be, in characters that are at least 4 mm in height;

(b) in the case of a product set out in column 2 of the schedule for which a maximum quantity of mercury or mercury compounds is prescribed in milligrams in column 3, the quantity of mercury or mercury compounds, as the case may be, contained in the product, expressed in milligrams, or a statement that the quantity of mercury or mercury compounds, as the case may be, is less than or equal to the quantity set out in column 3;

(c) in the case of a product other than one to which paragraph (b) applies, the quantity of mercury or mercury compounds, as the case may be, contained in the product, expressed in milligrams;

(d) the measures to be taken in case of accidental breakage and the risks associated with the use of the product, the address of a website where that information may be obtained, or contact information for a person who can provide that information;

(e) the options available for the disposal and recycling of the product in accordance with the laws of the jurisdiction where the disposal or recycling is to take place, the address of a website where that information may be obtained, or the contact information for a person who can provide that information; and

(f) a warning indicating that the product should be disposed of or recycled in accordance with the applicable laws.

Description

(2) The information must

(a) appear in both official languages;

(b) be in characters that are at least 3 mm in height, that are legible and indelible and that are impressed, embossed or in a colour that contrasts with the label’s background or the colour of the product, as applicable;

(c) be enclosed by a border; and

(d) be easily distinguishable from other graphic material on the product or its package.

Product not large enough

(3) If the product is too small to accommodate the information set out in subsection (1), the information must be indicated

(a) in a readily visible location on the package in which the product is sold or offered for sale; or

(b) in a notice attached to the product or in a manual that accompanies the product, if there is no package or if the package is too small to accommodate the information.

Symbol Hg

**9.** Any person that manufactures, imports, sells or offers for sale a product set out in any of subitems 1(2) to (20), (22) to (25) or (31) of column 2 of the schedule, must indicate in a readily visible location

on the product the symbol Hg, enclosed by a circle, in characters that are at least 3 mm in height, that are legible and indelible and that are impressed, embossed or in a colour that contrasts with the label's background or the colour of the product, as applicable.

## REPORTS

### Required information

**10.** Any person that manufactures or imports a product that contains a substance set out in column 1 of the schedule must submit to the Minister the following information, in accordance with section 14, on or before March 31 following the end of the calendar year during which the product was manufactured or imported:

(a) respecting the person,

(i) their name, civic and postal addresses, telephone number and, if any, fax number and email address, and

(ii) if applicable, the name, title, civic and postal addresses, telephone number and, if any, fax number and email address of their duly authorized representative; and

(b) respecting the product,

(i) its common or generic name and its trade name, if any,

(ii) the quantity of the substance contained in the product, expressed in milligrams,

(iii) an identification and description of its uses,

(iv) the quantity manufactured or imported in the calendar year in question,

(v) the quantity sold in Canada in the calendar year in question, and

(vi) the number of the permit issued under subsection 5(1), if applicable.

## TESTING REQUIREMENTS

### ACCREDITED LABORATORY

#### Accredited laboratory

**11.** Any analysis performed for the purposes of these Regulations must be conducted

(a) by a laboratory

(i) that is accredited by the Standards Council of Canada or any other accreditation body that is a signatory to the *International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement*, either under the International Organization for Standardization standard ISO/IEC 17025:2005, entitled *General requirements for the competence of testing and calibration laboratories*, as amended from time to time, or under an equivalent standard, and

(ii) for which the accreditation must include the analysis in question within its scope of testing; or

(b) by a laboratory

(i) that is accredited in accordance with the *Environmental Quality Act*, R.S.Q., c. Q-2, as amended from time to time, and

(ii) for which the accreditation must include the analysis in question within its scope of testing.

### DETERMINATION OF THE QUANTITY OF THE SUBSTANCE SET OUT IN COLUMN 1 OF THE SCHEDULE

#### Quantity of mercury or mercury compound

**12.** The quantity of mercury or of each mercury compound contained in a product is determined using the standard IEC 62321:2008, entitled *Electrotechnical products — Determination of levels of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated*

*diphenyl ethers*), as amended from time to time, except that the standard must be read as excluding the following:

- (a) sections 6.7.1, 6.7.3 to 6.7.5 and 8 to 10; and
- (b) Annexes A to C and F to H.

#### Certification of lamps

**13.** The quantity of mercury contained in a product set out in subitems 1(2) to (17), column 2, of the schedule must be certified by a certification body accredited by the Standards Council of Canada to the standard CAN-P-3G, entitled *General Requirements for Bodies Operating Product Certification Systems*, and to the standard CAN-P-1500M, entitled *Additional Requirements for Accreditation of Certification Bodies*.

#### FORMAT FOR SUBMISSION AND CERTIFICATION

##### Format for submission and certification

**14.** (1) Any information required to be submitted to the Minister under these Regulations must be submitted electronically in the format specified by the Minister.

##### Submission in writing

- (2) It may, however, be submitted in writing if
  - (a) no format is specified by the Minister; or
  - (b) it is, owing to circumstances beyond the control of the person required to submit the information, impracticable to submit the information electronically in the format specified.

##### Certification

(3) It must be accompanied by a certification, dated and signed by the person required to submit the information, or their duly authorized representative, that the information is accurate and complete.

#### RECORD KEEPING

##### Records

**15.** (1) Any person that manufactures, imports or sells a product that contains a substance set out in column 1 of the schedule must maintain records that demonstrate that the product in question was manufactured, imported or sold in accordance with the Act and these Regulations and that include the following information:

- (a) in the case of a person that manufactures a product,
  - (i) the quantity of the product manufactured at each manufacturing plant,
  - (ii) the common or generic name of the product manufactured, and its trade name, if any, and
  - (iii) the date of manufacture;
- (b) in the case of a person that imports a product,
  - (i) the quantity of the product imported,
  - (ii) the common or generic name of the product imported, and its trade name, if any,
  - (iii) the port of entry at which the product was imported,
  - (iv) the name, civic or postal address, telephone number and, if any, the fax number and email address of the principal place of business of the shipper,
  - (v) the date of import,
  - (vi) the Harmonized Commodity Description and Coding System number for the product,

- (vii) the importer number for the product shipped, and
  - (viii) copies of the bill of lading, invoice and all documents submitted to the Canada Border Services Agency for the product shipped; and
- (c) in the case of a person that sells a product to a supplier, wholesaler or retailer,
- (i) the quantity of the product sold,
  - (ii) the common or generic name and trade name, if any, of the product sold,
  - (iii) the date of the sale of the product,
  - (iv) the delivery date of the product, and
  - (v) the name, civic or postal address, telephone number and, if any, the fax number and email address of each supplier, wholesaler or retailer to whom the product was sold.

Retention of records

(2) The records and supporting documents must be kept for a period of at least five years after the day on which they are made.

Copy and retention of information submitted to Minister

**16.** (1) Any person that submits information to the Minister under these Regulations must keep a copy of that information, the certification referred to in subsection 14(3) and any supporting documents, for a period of at least five years after the day on which the information was submitted.

Location of records and information submitted to Minister

(2) The records, copies of information submitted to the Minister, certifications submitted in accordance with subsection 14(3) and supporting documents must be kept at the person's principal place of business in Canada or at any other place in Canada where they can be inspected. If they are kept at any place other than the person's principal place of business, the person must provide the Minister with the civic address of that place.

COMING INTO FORCE

January 1, 2012

**17.** These Regulations come into force on January 1, 2012.

SCHEDULE (Section 1, paragraph 2(f), subsections 3(1) and (2), subsection 4(1), subparagraph 4(2)(b)(ii), paragraphs 4(2)(e), 5(1)(c) and 8(1)(b), sections 9, 10 and 13 and subsection 15(1))

SUBSTANCES CONTAINED IN CERTAIN PRODUCTS

Column 1	Column 2	Column 3
Item Substance	Product Containing the Substance	Maximum Quantity of the Substance in the Product
1. Mercury	(1) Dental amalgam	No limit
	(2) Compact fluorescent lamp for general lighting purposes	3.5 mg
	(3) Linear fluorescent lamp for general lighting purposes	5 mg

(4) Non-linear fluorescent lamp for general lighting purposes, including a circular or square fluorescent lamp	15 mg
(5) Induction fluorescent lamp for general lighting purposes	15 mg
(6) Mercury vapour lamp for general lighting purposes ( $\geq 40$ watts and $\leq 1000$ watts)	(a) 50 mg until December 31, 2015 (b) 0 mg after December 31, 2015
(7) High pressure sodium vapour lamp	40 mg
(8) Metal halide lamp ( $\leq 300$ watts)	40 mg
(9) Metal halide lamp ( $> 300$ watts and $\leq 700$ watts)	65 mg
(10) Metal halide lamp ( $> 700$ watts and $\leq 1000$ watts)	150 mg
(11) Automobile headlamp	5 mg
(12) Cold cathode fluorescent lamp less than 1.5 m in length	5 mg
(13) Cold cathode fluorescent lamp more than 1.5 m in length	13 mg
(14) External electrode fluorescent lamp less than 1.5 m in length	5 mg
(15) External electrode fluorescent lamp more than 1.5 m in length	13 mg
(16) Cold cathode tubing for signage or cove lighting	100 mg per 2.44 m (8 feet)
(17) Fluorescent and discharge lamp other than those set out in subitems (2) to (16)	No limit
(18) High tech micro switch and high tech micro relay for monitoring and control equipment	20 mg

(19) Thermometer for use in a laboratory for scientific research applications	No limit
(20) Scientific instrumentation for the calibration of medical devices or for the calibration of scientific research instruments	No limit
(21) A laboratory analytical standard	No limit
(22) Scientific instrumentation used as reference for clinical validation studies	No limit
(23) Scientific instrumentation for measuring the quantity of mercury in the environment	No limit
(24) Radiation light detector	No limit
(25) Infrared light detector	No limit
(26) Low mercury chloride reference electrode	No limit
(27) Low mercury sulphate reference electrode	No limit
(28) Low mercury oxide reference electrode	No limit
(29) Professional, commercial and industrial photographic film	No limit
(30) Professional, commercial and industrial photographic paper	No limit
(31) Replacement part for a product if, prior to the coming into force of these Regulations, the product contained the part	No limit

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2. Mercury compounds

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Jozef M. Pacnya, Kyrre Sundseth, and Elisabeth G. Pacyna, Socio-economic Costs of Continuing the Status-Quo of Mercury Pollution (Nordic Council of Ministers, 2008).

[Footnote 2](#)

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[Footnote 3](#)

United Nations Environment Programme, Options for Substantive Provisions that might be Included in the Mercury Instrument — Note by the Secretariat (United Nations, 2010).

[Footnote 4](#)

ToxEcology, *Socio-Economic Study and Mass Balance Study for Mercury-Containing Products* (Environment Canada, 2009). Study is available upon request.

[Footnote 5](#)

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[Footnote 6](#)

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[Footnote 7](#)

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[Footnote 8](#)

Aaron T. Fisk et al., "An assessment of the toxicological significance of anthropogenic contaminants in Canadian arctic Wildlife," *Science of the Total Environment* 351-352, (2005).

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[Footnote 10](#)

Ibid.

[Footnote 11](#)

United Nations Environment Programme — Chemicals, *Global Mercury Assessment (Inter-Organization Programme For the Sound Management of Chemicals, 2002)*.

[Footnote 12](#)

Environment Canada, "Mercury and the Environment," Government of Canada, [www.ec.gc.ca/mercure-mercury/Default.asp?lang=En&n=DB6D2996-1](http://www.ec.gc.ca/mercure-mercury/Default.asp?lang=En&n=DB6D2996-1) (Accessed 2010).

[Footnote 13](#)

The Chlor-Alkali Mercury Liquid Effluent Regulations; and the Chlor-Alkali Mercury Release Regulations.

[Footnote 14](#)

The Hazardous Products Act; the Food and Drugs Act; the Pest Controls Products Act; the Import and Export of Hazardous Waste and Hazardous Recyclable Materials Regulations; the Disposal at Sea Regulations; and the Environmental Emergency Regulations.

[Footnote 15](#)

The Notice Requiring the Preparation and Implementation of Pollution Prevention Plans in Respect of Specified Toxic Substances Released from Base Metal Smelters and Refineries and Zinc Plants.

[Footnote 16](#)

Environment Canada, "National Pollutant Release Inventory," Government of Canada, [www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=B85A1846-1](http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=B85A1846-1) (Accessed 2010).

[Footnote 17](#)

ToxEcology, *Socio-Economic Study and Mass Balance Study for Mercury-Containing Products* (Environment Canada, 2009).

[Footnote 18](#)

Ibid.

[Footnote 19](#)

Industry Canada, "Canadian Industry Statistics," Government of Canada, [www.ic.gc.ca/cis-sic/cis-sic.nsf/IDE/cis-sic3351defe.html](http://www.ic.gc.ca/cis-sic/cis-sic.nsf/IDE/cis-sic3351defe.html)(Accessed 2010).

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[Footnote 21](#)

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[Footnote 22](#)

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[Footnote 23](#)

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[Footnote 30](#)

This estimate is the result of internal modeling done by EC.

[Footnote 31](#)

Health Canada, "Mercury and Human Health," Government of Canada, [www.hc-sc.gc.ca/hl-vs/iyh-vsv/enviro/merc-eng.php](http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/enviro/merc-eng.php) (Accessed 2010).

[Footnote 32](#)

From 1990 to 2003, under the terms of a Canada-wide standard, Canadian manufacturers reduced the average mercury content per lamp by 67% from 43 mg per lamp to 11.4 mg. Electrofed (Canada's industry association) announced recently that the average mercury content in lamps was 7.9 mg by 2006.

[Footnote 33](#)

Information gained during consultation with the industry association.

[Footnote 34](#)

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[Footnote 35](#)

Maine Department of Environmental Protection, Mercury-free Button Batteries: Their Reliability and Availability (2009).

[Footnote 36](#)

This estimate does not take into account the elasticity of demand for thermometers.

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[Footnote 38](#)

This estimate does not take into account the elasticity of demand for batteries

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[Footnote 40](#)

Lamp manufacturers currently test their products for Standards Council of Canada certification which involves testing and record keeping. Labelling is also a requirement for the industry to sell lamps in many U.S. states.

[Footnote 41](#)

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[Footnote a](#)

S.C. 2004, c. 15, s. 31

[Footnote b](#)

S.C. 1999, c. 33

**NOTICE:**

The format of the electronic version of this issue of the *Canada Gazette* was modified in order to be compatible with extensible hypertext markup language (XHTML 1.0 Strict).

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