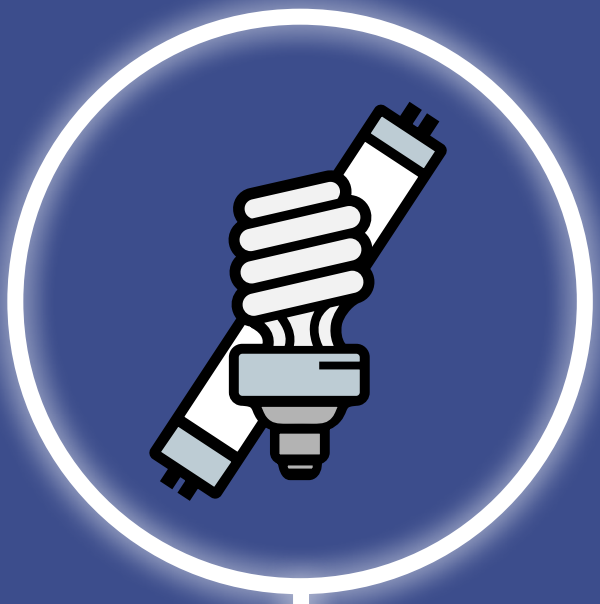
National Strategy for Lamps Containing Mercury



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Executive Summary

In 2019, the Government of Canada released the National Strategy for Lamps Containing Mercury (the Strategy). The Strategy's vision is to **eliminate lamps as a source of mercury pollution in Canada** by ensuring lamps containing mercury are collected and recycled responsibly and encouraging Canadians to buy mercury-free lighting alternatives. The following represent key developments, since the publication of the Strategy in 2019, that support the vision to eliminate lamps as a source of mercury pollution in Canada:

- Between 2019 and 2022, lamps containing mercury sales declined by almost 25%. This decline in sales is part of a larger downward trend dating back to 2007 – the peak sales year – when 83.5 million lamps containing mercury were sold compared to 17.6 million in 2022. This decline represents a 79% decrease in lamp containing mercury sales between 2007 and 2022.
- On June 19, 2024, the Government of Canada published the final *Regulations Amending the Products Containing Mercury Regulations*, which will prohibit the import and manufacture of the most common lamps containing mercury for general lighting purposes as of December 31, 2025. Prohibiting the manufacture and import of the most common lamps containing mercury in Canada is identified as a key priority in the Strategy.
- The implementation of two new provincially mandated Extended Producer Responsibility (EPR) programs and a third launching in 2026, brings the total number of EPR programs for lamps containing mercury in Canada to seven. Through these EPR programs, over 80% of Canadians now have access to Product Care Recycling's network of 1,500 recycling locations, ensuring the environmentally sound management of lamps containing mercury at end-of-life.
- Between 2018 and 2022, over 103 million lamps containing mercury have been recycled responsibly, keeping approximately 630 kg of mercury out of the environment.
- Due to domestic and international policies targeting products containing mercury, combined with product innovations in mercury-free energy efficient lighting, the market for recovered mercury has all but disappeared, resulting in the permanent and environmentally sound disposal of mercury in specially designed and secure landfills.

As a result of these developments, significant strides have been made towards achieving the Strategy's vision to eliminate lamps as a source of mercury pollution in Canada. ECCC will continue to administer the voluntary industry data call to enable ongoing tracking of lamps containing mercury diversion and sales data. These performance indicators will provide insight into the impact of the regulatory amendments phasing out the import, manufacture and the sale of the most common types of lamps containing mercury used for general lighting purposes in Canada, for inclusion in the next Report to Parliament in five years.

1. Introduction

In 2019, the Government of Canada released the National Strategy for Lamps Containing Mercury (the Strategy). The Strategy aims to eliminate lamps as a source of mercury pollution in Canada by ensuring lamps containing mercury are collected and recycled responsibly, while encouraging Canadians to buy mercury-free lighting alternatives.[1]

The Strategy was developed as a result of the *National Strategy for Safe and Environmentally Sound Disposal of Lamps Containing Mercury Act* (the Act), which received royal assent on June 22, 2017. The Act tasked the Minister of the Environment with developing a strategy for the safe disposal of lamps containing mercury in Canada. Section 4 of the Act sets out a condition that five years after the publication of the Strategy, the Minister of the Environment will prepare a report to Parliament on the effectiveness of the strategy.[2]

Starting in the early 2000's, lamps containing mercury were widely encouraged as replacements for incandescent lightbulbs as they are significantly more energy-efficient and have a longer lifespan.[3] Lamps containing mercury use a low-pressure mercury electrical discharge in which a fluorescent coating transforms ultraviolet energy into visible light.[4] This small amount of mercury may be released when the lamps break or are improperly disposed. The mercury powder and vapour released from these broken lamps pose a potential risk to human health and the environment. Therefore, it is important that lamps containing mercury are managed properly at their end-of-life to prevent the release of mercury.

The Strategy is part of a number of risk management activities that the federal government has undertaken over the past few decades targeting mercury in products.[5] Mercury is on the List of Toxic Substances in Schedule 1 of the *Canadian Environmental Protection Act, 1999* (CEPA). To reduce the impact of Schedule 1 substances on the environment and human health, Environment and Climate Change Canada (ECCC) and Health Canada are responsible for developing and implementing regulations or other instruments that will prevent or control their use and/or release.[6]

[1] Environment and Climate Change Canada, 'National Strategy for Lamps Containing Mercury' (1 June 2019) www.canada.ca/en/environment-climate-change/services/pollutants/mercury-environment/strategy-lamps-mercury/strategy.html.

[2] Environment and Climate Change Canada, 'Code of Practice: Environmentally Sound Management of End-of-Life Lamps Containing Mercury' (11 February 2017) www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/guidelines-objectives-codes-practice/sound-management-lamps-containing-mercury.html.

[3] Environment and Climate Change Canada, 'Baseline Report: End-of-Life Management of Lamps Containing Mercury in Canada' (1 September 2023) www.canada.ca/en/environment-climate-change/services/pollutants/mercury-environment/strategy-lamps-mercury/baseline-report.html.

[4] Environment and Climate Change Canada (n 2).

[5] Environment and Climate Change Canada, 'Toxic Substances List: Mercury' (12 August 2009) www.canada.ca/en/environment-climate-change/services/management-toxic-substances/list-canadian-environmental-protection-act/mercury.html.

[6] Environment and Climate Change Canada, 'List of Toxic Substances Managed under Canadian Environmental Protection Act' (21 July 2009) www.canada.ca/en/environment-climate-change/services/management-toxic-substances/list-canadian-environmental-protection-act.html.

1.1 National Strategy for Lamps Containing Mercury

The Strategy recommends actions to engage and mobilize public, private, and non-profit sectors to ensure that lamps containing mercury are diverted in an environmentally sound manner and that a transition to mercury-free lamps occurs as soon as feasible.

The Strategy was developed through consultation with provincial, territorial, Indigenous, and local governments as well as other interested stakeholders, such as non-governmental organizations (NGO) and the industrial, commercial, and institutional (ICI) sector.

The vision of the Strategy is to eliminate lamps as a source of mercury pollution in Canada.

To achieve this vision, three goals were identified:

1. **Canadians increasingly use mercury-free alternatives.**
2. **Canadians do their part to properly manage lamps containing mercury.**
3. **Diversion is performed in an environmentally sound manner.**

Measurement Framework

In addition to establishing the vision and goals for the Strategy, ECCC worked with provinces, territories and interested stakeholders to develop a measurement framework. The framework outlines the methodology for estimating the quantities of lamps containing mercury that are diverted from landfills in Canada, and to assess the market shift to mercury-free lighting alternatives.

In 2019, following the development of the measurement framework, ECCC began issuing annual voluntary data calls to lamp processors across Canada to obtain the types and quantities of lamps containing mercury processed through their facilities. Processing is defined as any method that breaks down lamps to separate the mercury from other components while minimizing releases of mercury.[7]

Additionally, annual sales data for lighting products is shared by Electro-Federation Canada (EFC), a national association whose membership includes the majority of lamp manufacturers selling into the Canadian market. EFC tracks sales in Canada by jurisdiction, sector, and lamp type.

Finally, Product Care Recycling (PCR) is an industry-led organization that administers the Extended Producer Responsibility (EPR) programs for lighting in a number of provincial jurisdictions across Canada. PCR also provides relevant information voluntarily through the annual data call.[8]

[7] Environment and Climate Change Canada, 'National Strategy for Lamps Containing Mercury' (n 1).

[8] Product Care Recycling, 'Light Recycling' (27 February 2024) www.productcare.org/products/lights/.

1.2 Lamps Containing Mercury

Reporting and analysis under the Strategy's measurement framework focus on the most common types of lamps containing mercury used for general lighting purposes, which account for 75% of the mercury found in lamps in Canada.[9] Lamp types can be divided into three categories as illustrated in Figure 1:

- compact fluorescent lamps (CFLs) – commonly used in homes,
- linear fluorescent lamps (LFLs) and non-linear fluorescent lamps – commonly used in the Institutional, Commercial and Industrial (ICI) sector, and
- high intensity discharge lamps (HIDs) – mostly used for street lighting and for lighting large areas like warehouses, parking lots, and arenas.

Figure 1. Types of Mercury Lamps

Source: Key results from the 2022 reports under the *Products Containing Mercury Regulations* - Canada.ca

1.3 Products Containing Mercury: Regulations

Prior to the publication of the Strategy, under the authority of the *Canadian Environmental Protection Act, 1999*, the *Products Containing Mercury Regulations* (the Regulations) were published in November 2014 and came into force on November 8, 2015.[10] While the Strategy addresses the responsible end-of-life management of lamps containing mercury, the focus of the Regulations is to manage and monitor the manufacture and import of these products as they enter the Canadian marketplace at the beginning of their lifecycle.

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[9] Environment and Climate Change Canada, 'Key Results from the 2022 Reports under the *Products Containing Mercury Regulations*' (18 March 2024) www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/publications/key-results-2022-products-containing-mercury-regulations.html.

[10] Legislative Services Branch, *Products Containing Mercury Regulations* (SOR/2014-254) 2024. *Products Containing Mercury Regulations*https://laws-lois.justice.gc.ca/eng/regulations/SOR-2014-254/index.html.

The Regulations broadly prohibit the import and manufacture in Canada of all products containing mercury or any of its compounds. However, exemptions were made for essential products that had no technically or economically viable alternatives at the time of publication. These exemptions include products such as dental amalgam, certain lamps, and certain scientific instruments.

For the exempted products, the Regulations:

- set content limits on the maximum quantity of mercury in certain exempted products such as compact fluorescent lamps (CFLs) and linear fluorescent lamps (LFLs),
- require labelling in both official languages on exempted products containing mercury so that consumers are aware of the presence of mercury, and
- require organizations that import or manufacture exempted products containing mercury in Canada to report to ECCC every three years.

1.4 Products Containing Mercury: Reporting

The Regulations' triennial reporting requirement allows ECCC to measure the progress in reducing the use of mercury in exempted products. ECCC publishes key findings from the information reported by the industry and other regulatees. Currently, data is available for the 2016, 2019, and 2022 reporting years.

In 2016, the first reporting year under the Regulations, total mercury in all products reported was 1104 kilograms (kg). Lamps represented the largest grouping of products in terms of quantity of units imported and manufactured, but only accounted for 38% (423 kg) of the total mercury in products. Dental amalgam accounted for 57% (632 kg) of the mercury in products, with measuring instruments and other products accounting for the remaining 5% (49 kg).[11]

In 2019, the total mercury in all products reported was 655 kg, and in 2022, this number dropped further to 509 kg. Between 2016 and 2022, the overall quantity of mercury found in products in Canada decreased by 54%. This decline is largely due to a 72% decrease in the number of lamps containing mercury that were manufactured or imported in Canada during the same period, with 64.4 million reported in 2016 down to 17.8 million in 2022.[12]

In 2022, the most recent reporting year, lamps accounted for only 16% (84 kg) of the mercury found in products manufactured or imported in Canada.[13] This represents a decrease of 80% in the quantity of mercury found in lamps between 2016 and 2022. Most of the mercury in products continues to be found in dental amalgam, which in 2022 accounted for 74% (376 kg) of mercury. Measuring instruments and reference material accounted for 10% (49 kg), as shown in Figure 2. In 2022, over 99.9% of all products containing mercury were imported with the rest, mainly lamps, manufactured in Canada.[14]

Of note, dental amalgam disposal is managed through a pollution prevention planning notice, which encourages dental facilities to implement best management practices and has resulted in a 97% adoption rate for dental amalgam separators at these facilities.[15]

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[11] Environment and Climate Change Canada, '*Products Containing Mercury Regulations* 2016 Summary Report: Key Results' (29 November 2019) www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/products-mercury-regulations-2016-summary-key-results.html.

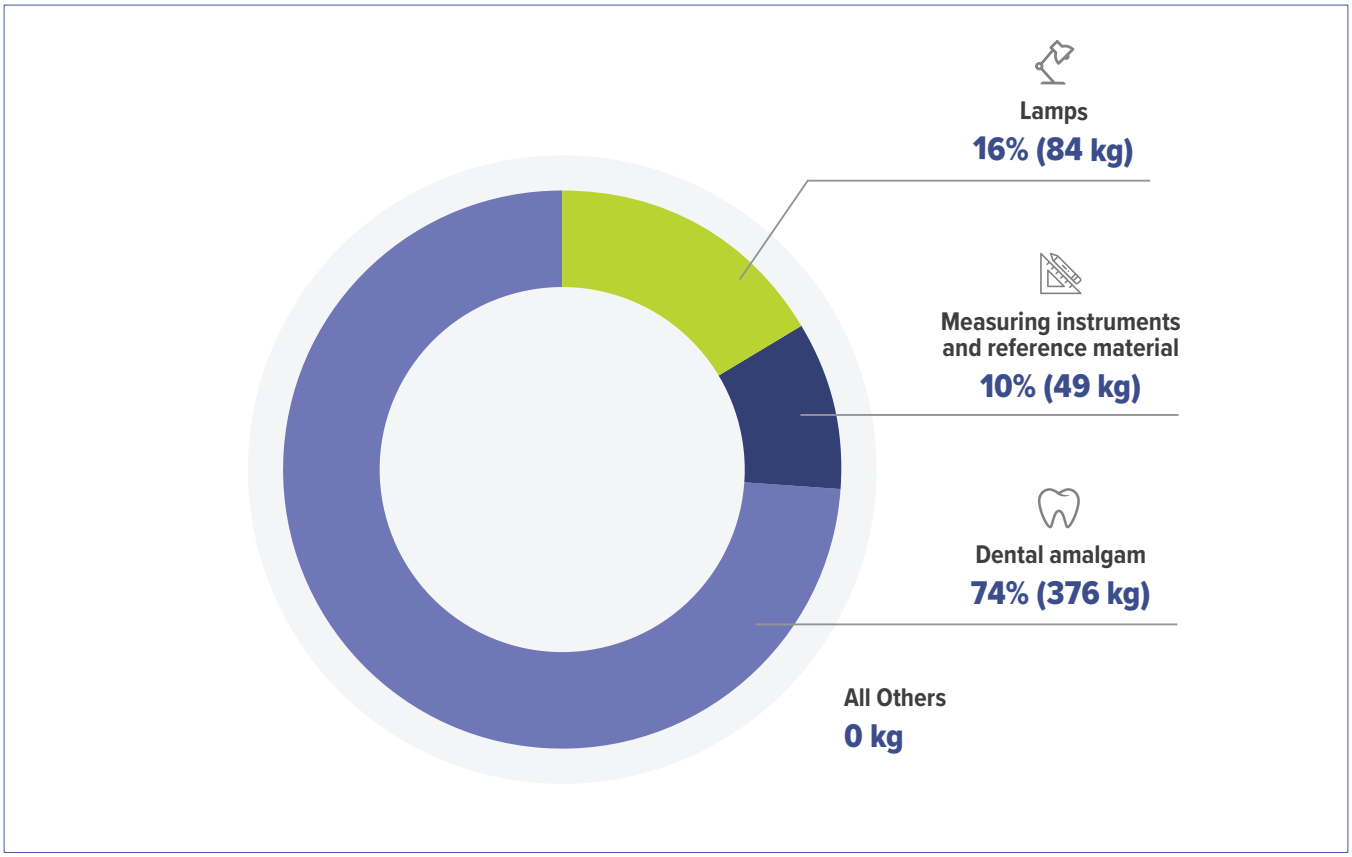
[12] Environment and Climate Change Canada, 'Key Results from the 2022 Reports under the *Products Containing Mercury Regulations*' (n 9).

[13] ibid.

[14] ibid.

[15] Environment and Climate Change Canada, '*Products Containing Mercury Regulations* 2016 Summary Report' (n 11); Environment and Climate Change Canada, 'Dental Amalgam Waste (Mercury): Pollution Prevention Planning Notice' (14 October 2009) www.canada.ca/en/environment-climate-change/services/pollution-prevention/planning-notices/performance-results/dental-amalgam-waste-mercury-overview.html.

Figure 2. Mercury in Products in Canada, 2022



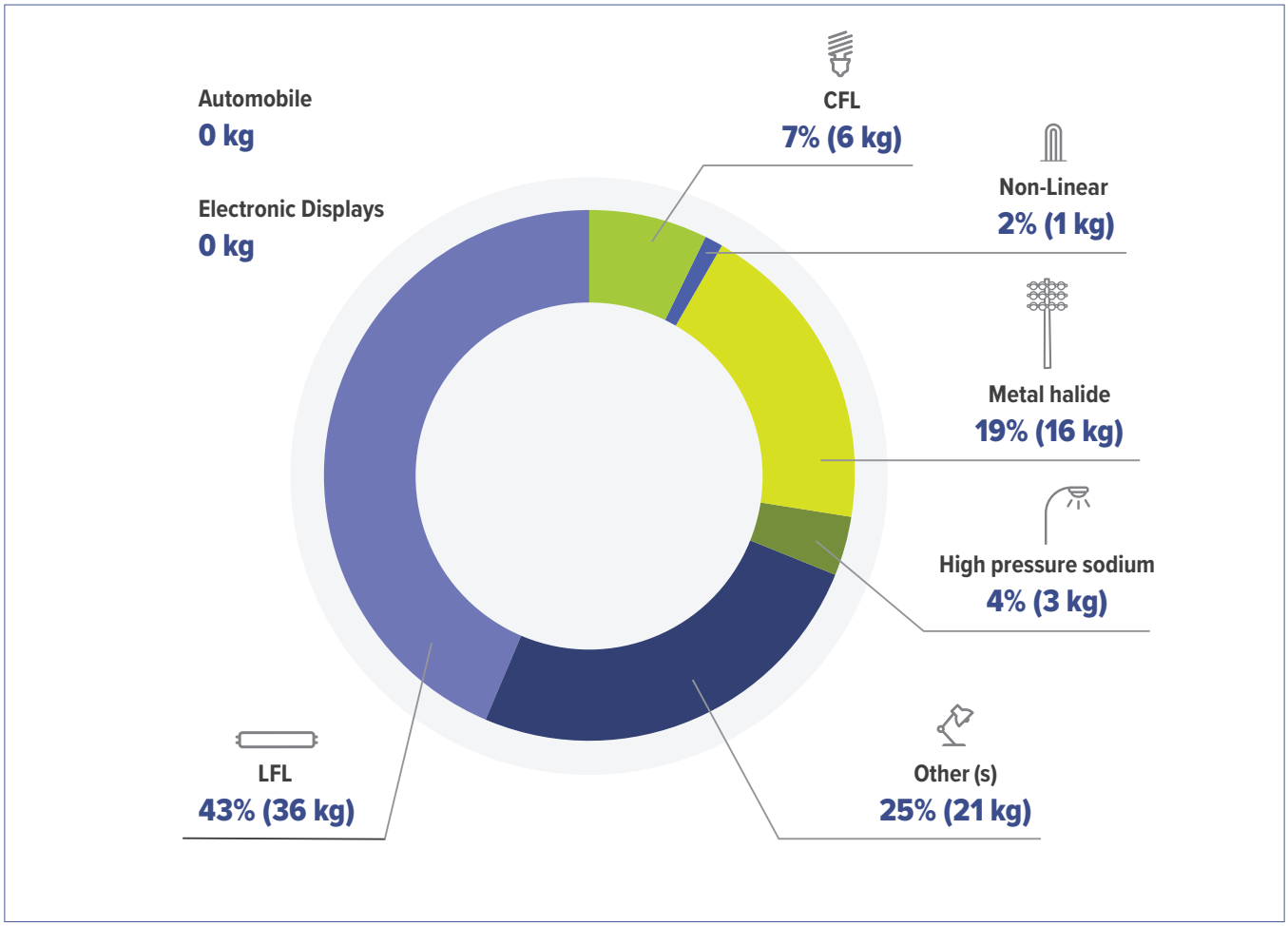
Source: Key results from the 2022 reports under the *Products Containing Mercury Regulations* - Canada.ca

In 2022, LFLs (43 %), CFLs (7%), and non-linear fluorescent lamps (2%) represented over 50% of the mercury found in lamps in Canada. Similarly, metal halide (19%) and high-pressure sodium vapour lamps (4%), both forms of high intensity discharge (HID) lamps, accounted together for 23% of mercury in lamps. Combined, these most common lamps containing mercury types used for general lighting purposes accounted for 75% of the mercury found in lamps in Canada, as shown in Figure 3.[16] The other 25% of mercury in lamps was found in specialty lamps, such as ultra-violet lamps for air and water purification. Automobile headlamps together with electronic displays, mainly imported as replacement lamps, accounted for less than 1% of the total mercury in lamps.[17]

[16] Environment and Climate Change Canada, 'Key Results from the 2022 Reports under the *Products Containing Mercury Regulations*' (n 9).

[17] ibid.

Figure 3. Mercury in Lamps in Canada, 2022



Source: Key results from the 2022 reports under the *Products Containing Mercury Regulations* - Canada.ca

2. National Strategy: Update on Goals

The Strategy goals support the vision to "eliminate lamps as a source of mercury pollution in Canada" and were developed with organizations across Canada that play a role in delivering environmentally sound management of lamps containing mercury.

2.1 Goal 1: Canadians increasingly use mercury-free alternatives

Dimming Demand: Sharp Decline in Mercury Lamp Sales

As part of the Strategy measurement framework, ECCC analyses annual data on national lamp sales, provided by Electro-Federation Canada, to assess the market shift to mercury-free lighting alternatives. Historical lamp sales data from before the Strategy was published in 2019 has also been provided to ECCC. Over the past several years there has been an ongoing market decline of lamps containing mercury in Canada now that most lamps exempt from the general mercury prohibition have readily available mercury-free substitutes, such as LEDs, that are affordable, more energy efficient, and have a longer lifespan.[18]

Between 2019, when the Strategy was published, and 2022, sales of lamps containing mercury declined by almost 25%. CFL sales saw the largest decline during this period dropping 47%. This decline in sales is part of a larger downward trend dating back to 2007 – the peak sales year for lamps containing mercury – when 83.5 million lamps were sold compared to 17.6 million in 2022. This decline represents a 79% decrease in sales of lamps containing mercury between 2007 and 2022. During this period, CFLs experienced the largest overall decline in sales at 92%, followed by HIDs declining 80%, and LFL sales dropping 68%. The majority of sales of lamps containing mercury in 2022 were to the ICI sector. As of 2022, LED lamps occupy 73% of the lighting market in Canada.[19]

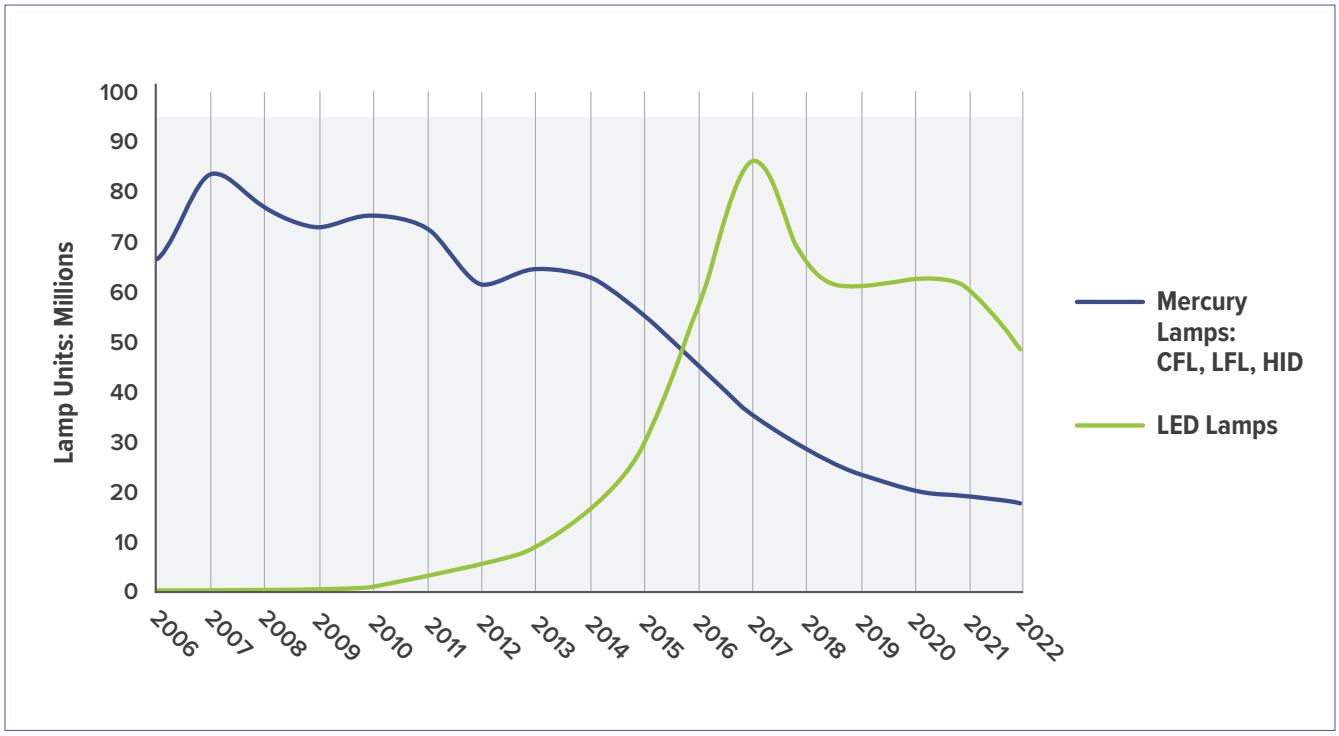
LED lamp sales began outpacing the sale of lamps containing mercury in 2016, as illustrated in Figure 4. The 2018 British Columbia Lights and Lamp Equipment Stewardship Plan noted that, "The market shift to LEDs has been occurring at a faster rate than initially anticipated."[20] As lamps containing mercury sales continue their downward trend, there will be fewer lamps containing mercury being disposed and available for processing in the years to come.

[18] Department of the Environment, Department of Health, Government of Canada, 'Canada Gazette, Part 1, Volume 156, Number 52: *Regulations Amending the Products Containing Mercury Regulations*' (24 December 2022) https://canadagazette.gc.ca/rp-pr/p1/2022/2022-12-24/html/reg1-eng.html.

[19] Environment and Climate Change Canada, 'National Strategy for Lamps Containing Mercury' (n 1).

[20] Bob McDonald and Mark Kurschner, 'British Columbia Lamps and Lighting Equipment Stewardship Plan' (March 2012). www2.gov.bc.ca/assets/gov/environment/waste-management/recycling/recycle/lighting/sp/lamps__lighting_equipment_stewardship_plan_march_12.pdf.

Figure 4. Lamps Sales in Canada, 2006-2022



Source: *National Strategy for Lamps Containing Mercury: Measurement Framework Analysis*

Making the Switch: Government of Canada Facilities Transitioning to Mercury-Free Lighting

The Government of Canada is also transitioning to mercury-free LED lighting. The Greening Government Strategy is an initiative in part to reduce greenhouse gas emissions from federal operations by 40% by 2030. As one of the four key priority areas is to maximize energy efficiency in existing buildings, Government of Canada properties are being retrofitted with LED lighting. For example, a lighting retrofit was completed in 2020 at Place Vincent Massey in Gatineau, Quebec, where approximately 12 000 lamps were recycled and replaced with LEDs.

> **"Replacement of [mercury] lighting by LED is part of Public Services and Procurement Canada's (PSPC) Real Property Strategy to improve its greening performance."**
> Senior Director, Greening Government Directorate, Real Property Branch, PSPC

Leaving Mercury Lamps in the Dark: Prohibiting their Manufacture and Import

Amending federal Regulations to prohibit the manufacture and import of the most common lamps containing mercury in Canada was identified as a key priority in the Strategy.[21]

To fulfil international commitments on mercury-containing products, and to further accelerate the market transition to mercury-free lighting alternatives, and in support of the recommendations in the Strategy, on June 19, 2024, the Government of Canada published in *Canada Gazette*, Part II amendments to the *Products Containing Mercury Regulations* (the Regulations) that will gradually phase out the exemptions for the most common types of lamps containing mercury.[22] These amendments will come into force on June 19, 2025, and send a clear signal to consumers to make the shift to mercury-free lighting if they have not done so already.

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[21] Environment and Climate Change Canada, 'National Strategy for Lamps Containing Mercury' (n 1).

[22] Department of the Environment, Department of Health, Government of Canada, 'Canada Gazette, Part 2, Volume 158, Number 13: *Regulations Amending the Products Containing Mercury Regulations*' (19 June 2024) https://gazette.gc.ca/rp-pr/p2/2024/2024-06-19/html/sor-dors109-eng.html.

All lamp types targeted by the amendments can be replaced with affordable light-emitting diode (LED) alternatives, which are mercury-free, have a longer lifespan, and are more energy efficient.[23] The start of the prohibition for the import and manufacture of lamps containing mercury is January 1, 2026, for CFLs, LFLs and non-linear fluorescent lamps, and January 1, 2029, for HID lamps.

For transition purposes, the amendments allow replacement lamps to continue to be imported or manufactured for pin-base CFLs, LFLs and non-linear fluorescent lamps for a two-year period, which will end on January 1, 2028. Eventually, the sale of these replacement lamps will be prohibited on January 1, 2030. For screw-based CFLs, no replacement exemption is included in the amendments, meaning their manufacture and import will be prohibited as of January 1, 2026. Retailers will be able to sell any remaining stock beyond this date.

During the consultation on the proposed amendments to the Regulations, industry representatives expressed concerns regarding the technical compatibility of LEDs with HID lamp fixtures. As a result, a more gradual phase down of these lamp types is set out in the amendments to the Regulations. The import and manufacture of HID lamps for general lighting will be prohibited on January 1, 2029, though replacement lamps for HID lamp types will be exempted with no end date. This approach aims to promote the use of mercury-free LED lighting in new installations, while allowing for the continued use of existing HID lamp fixtures.

In addition, upon coming into force in June 2025, the amendments will lower the mercury content limit allowed for LFLs. The Regulations will continue to have limited exemptions for essential products which have no technically or economically viable alternatives, such as fluorescent lamps used for growing plants, water treatment or air filtration.

Following the publication of these amendments, an educational email campaign promoting the gradual phase out of lamps containing mercury was sent to key stakeholders. Over 1,100 stakeholders received a factsheet which included a summary of the amendments, a link to the Strategy, and a call to action for adopting the best practices for the end-of-life management of lamps containing mercury, as outlined in the *Code of Practice: Environmentally Sound Management of End-of-Life Lamps Containing Mercury*.[24] Included in the distribution list were influencers (e.g. industry associations), regulatees (e.g. past reporters), potential regulatees (e.g. those that commented during the consultations), and Indigenous partners.

2.2 Goal 2: Canadians do their part to properly manage lamps containing mercury

Keeping Lamps Containing Mercury out of Landfills

In addition to assessing lamp sales data under the measurement framework set out in the Strategy, ECCC also analyses voluntarily submitted data from lamp processors across Canada to estimate the quantities of lamps containing mercury that are diverted from landfill through recycling.

As outlined in the measurement framework methodology in the Strategy, diversion rates are estimated based on the number of lamps recycled in a given year against the number of lamps sold five years prior. Under the measurement framework, a lamp containing mercury is assumed to be discarded five years after purchase. While this is on the lower end of the expected lifespan for most lamps containing mercury, it takes into account the rapid market shift to LEDs across sectors, which is reportedly causing some lamps to be diverted before they reach end-of-life.[25]

[23] Environment and Climate Change Canada, 'Key Results from the 2022 Reports under the *Products Containing Mercury Regulations*' (n 9).

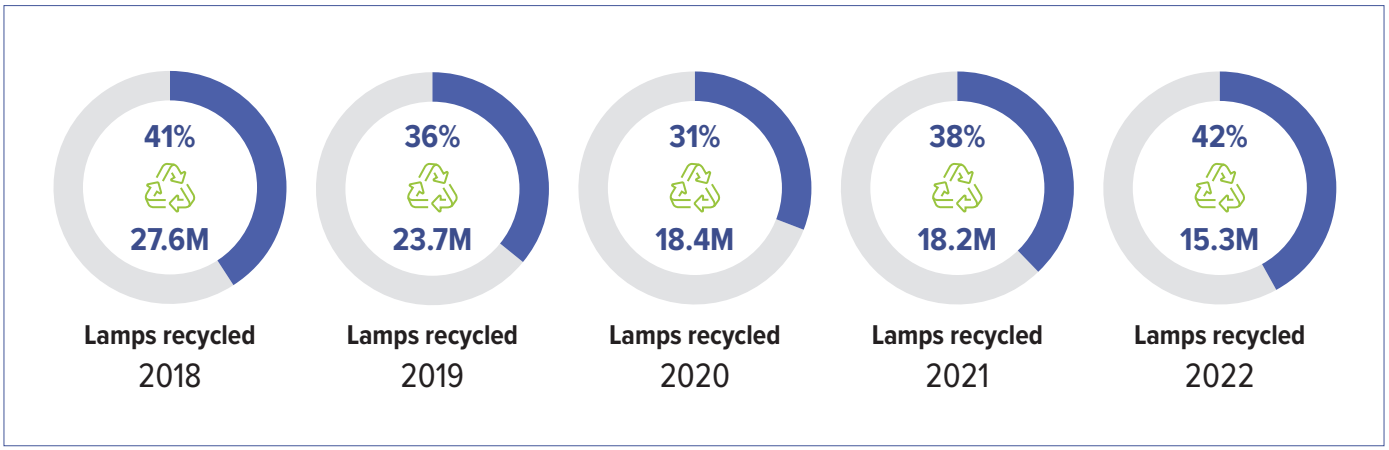
[24] Environment and Climate Change Canada, Code of Practice: Environmentally Sound Management of End-of-Life Lamps Containing Mercury (n 2).

[25] Environment and Climate Change Canada, 'National Strategy for Lamps Containing Mercury' (n 1).

ECCC began issuing the voluntary data call to lamp processors in 2019 for the 2018 calendar year. Data is currently available from 2018 through to 2022. Since 2018, over 103 million lamps have been recycled in an environmentally sound manner across Canada. In total, about 630 kg of mercury has been recovered from these lamps. As shown in Figure 5, national diversion rates have ranged between 31% and 42% between 2018 and 2022.[26]

The particularly low diversion rate observed in 2020 may be a result of the closure of recycling depots, retailer take-back programs, and cancelled municipal household hazardous waste collection events due to Covid-19 restrictions. It is anticipated that the national diversion rate will continue to trend up as more Canadians now have access to EPR programs in Canada following the launch of Ontario's lighting EPR program in January 2023, Nova Scotia's program in August 2024, and New Brunswick's program in 2026. Though it is anticipated the national diversion rate will rise, it is expected that the overall number of lamps containing mercury available for recycling will continue to decline year after year in line with the declining sales trend.

Figure 5. Annual Diversion Rates in Canada, 2018-2022



National Strategy for Lamps Containing Mercury: Measurement Framework Analysis

Enhancing Existing and Introducing New Diversion Initiatives

Expanding existing regulatory requirements for the end-of-life management of lamps containing mercury and introducing additional requirements were identified in the Strategy as key actions to encourage further diversion. To support provinces, territories, and others develop or enhance their requirements around the end-of-life management of lamps containing mercury, in 2020, ECCC commissioned a report titled, *End-of-Life Management of Lamps Containing Mercury: Best Practices in Program Design and Implementation*. The report identifies best practices for both regulated and voluntary (e.g. retail take-back) lighting diversion programs.[27]

Extended Producer Responsibility (EPR) legislation is considered a best practice approach for the end-of-life management of products as EPR programs establish dedicated funding models and transfer the cost of diversion from municipalities to those who are putting the designated products on the market. Additionally, EPR programs establish numerous collection points (including permanent depots as well as temporary or seasonal collection events), develop transportation networks, provide promotion and education, and work with recycling experts to develop processing and auditing standards to ensure environmentally sound management of collected materials.[28]

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[26] ibid.

[27] Environment and Climate Change Canada, 'Explaining the Environmental Codes of Practice Process' (21 August 2019) www.canada.ca/en/environment-climate-change/services/pollution-prevention/environmental-risk-management-instruments/codes-of-practice/process.html.

[28] Environment and Climate Change Canada, 'Baseline Report' (n 3).

British Columbia (BC), Manitoba (MB), Quebec (QC), and Prince Edward Island (PE) had EPR programs for lamps containing mercury in place prior to the publication of the Strategy in 2019. Ontario (ON) and Nova Scotia (NS) launched their EPR programs for lighting on January 1, 2023, and August 1, 2024, respectively, to be followed by New Brunswick's (NB) program launch in 2026. All these programs cover the most common lamps containing mercury used for general lighting purposes, including LFLs and CFLs. Following the launch of Ontario and Nova Scotia's EPR programs, over 80% of Canadians now live in a jurisdiction with a provincially mandated light recycling program.

To encourage greater recycling of lighting products overall, the Strategy recommended broadening the scope of EPR programs to include not only lamps containing mercury but also other lighting products such as LEDs. Five of the seven EPR lighting programs, including the programs ON, NS and NB, cover other lighting products in addition to lamps containing mercury.

To support greater harmonization between EPR programs, the Strategy recommended the inclusion of lamps from both the residential and ICI sectors, the latter typically generating larger volumes of lamps. Designating lamps from both sectors in regulations is considered a best practice as it provides a level playing field among all consumers, secures higher program revenues, and captures the largest source of lamps.[29] Following the inclusion of the ICI sector in Manitoba's EPR program in 2020, all existing EPR lighting programs in Canada now include collection from both residential and ICI sectors. In 2019, the year before Manitoba expanded its program to include the ICI sector, 191 406 lamp units were collected.[30] By 2021, the number of collected units had risen to 308,201, marking a 61% increase following the program's expansion.[31]

All lighting EPR programs in Canada are administered by Product Care Recycling (PCR). PCR is a Canadian not-for-profit, industry-led association. PCR provides a network of over 1500 recycling locations in the provinces with EPR lighting programs including municipal, private, and retail sites, in addition to hosting collection events. The program also provides a free pickup service for businesses and institutions for recycling large volumes. PCR has incorporated a "Find a Recycling Location" search function on their website for Canadians in EPR covered jurisdictions to easily search for the nearest recycling locations.[32]

Additionally, PCR continues to enhance collection services for lamps containing mercury to a number of Indigenous communities. For example, in spring 2023, the Indigenous Zero Waste Technical Advisory Group (IZWTAG), a BC Indigenous organization founded in 2019 with the aim of assisting First Nations implement zero waste programs, signed a partnership with three BC stewardship agencies, including PCR. This partnership was to ensure EPR materials, such as lamps, in First Nation communities across BC are collected, handled, stored, transported, and managed responsibly at their end-of-life.[33]

Through this initiative, PCR has increased accessibility to permanent collection sites and special events for 59 First Nation communities in 2023, up from 29 in 2022.[34] Additionally, PCR's First Nations Winter Road Collection program in Manitoba, first piloted in 2019, provides services to remote First Nations communities accessible by seasonal ice roads. This program collected and removed 24 boxes of lamps from six of these First Nations Communities in 2023.[35]

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[29] Giroux Environmental Consulting, 'End-of-Life Management of Lamps Containing Mercury: Best Practices in Program Design and Implementation', 2020.

[30] Product Care Association of Canada, 'Manitoba Household Hazardous Waste Annual Report'. 2019. www.agrp.ca/wp-content/uploads/2022/05/2021-Manitoba-HHW-Annual-Report.pdf.

[31] Product Care Association of Canada. Manitoba Household Hazardous Waste Annual Report. 2021. www.agrp.ca/wp-content/uploads/2022/05/2021-Manitoba-HHW-Annual-Report.pdf.

[32] 'About Us' (Product Care Recycling) www.productcare.org/about/.

[33] Lucinda, 'MOU Signing' (Indigenous Zero Waste Technical Advisory Group, 5 July 2023) https://izwtag.com/news/mou-signing/.

[34] Product Care Association of Canada. British Columbia Lights Program 2022 annual report (2023).

[35] Product Care Association of Canada. British Columbia Lights Program 2023 annual report (2024).

2.3 Goal 3: Diversion is performed in an environmentally sound manner

Guidance and Best Practices: Minimizing the Risk of Mercury Releases to the Environment

In 2017, prior to the publication of the Strategy, ECCC published the Code of Practice for the *Environmentally Sound Management of End-of-life Lamps Containing Mercury* (the Code of Practice). Codes of Practice are voluntary instruments developed by ECCC in collaboration with stakeholders to achieve specific environmental or human health objectives.[36] The Code of Practice complements provincial, territorial and others' initiatives, and promotes best practices for managing the end-of-life of lamps containing mercury, including options for northern and remote areas. The Code of Practice outlines best practices for the collection, storage, transportation, and processing of lamps containing mercury upon their disposal to prevent the release of mercury into the environment. The Code of Practice was developed in consultation with experts from provincial and territorial governments, industry and stewardship organizations, and other stakeholders.[37]

To complement the guidance resources already available, such as the Code of Practice and the best practices report on end-of-life management of lamps containing mercury, in 2020, ECCC commissioned a report titled *Review of Requirements for Storage, Transport and Disposal of Mercury Waste in Canada*. This report provides a comprehensive overview of provincial, territorial and federal requirements and guidance, and common industry best practices, for storage, transport and disposal of mercury waste with a focus on lamps containing mercury.

Environmentally Sound Management of Recycled Mercury Containing Lamps

As noted previously, provincially regulated EPR lighting programs develop processing and auditing standards to ensure the environmentally sound management of collected materials. PCR, who administers all provincial EPR lighting programs in Canada, sends collected lamps to authorized processors to be recycled in a controlled environment. Lamp processors use crushing and separating technologies to disaggregate lamps containing mercury into three main component parts: metals, glass, and mercury in phosphor powder.[38]

The metal and glass recovered are treated as non-hazardous and the metals are recycled, while the glass may be used in various applications such as concrete filler, sandblasting, or septic drainage material.[39] With respect to mercury in phosphor powder, the Basel Convention, to which Canada is a Party, outlines the following as accepted methods for the environmentally sound management of mercury wastes: reclamation of mercury, chemical stabilization followed by disposal in a specially engineered landfill, and permanent storage.[40]

A key finding from the research conducted for the report on requirements for storage, transport, and disposal of mercury waste was that mercury recycling (or reclamation) has "all but disappeared." The lamp processing industry in Canada was historically developed for the purpose of recycling mercury.[41] It is noted in the 2019 *Baseline Report: End-of-Life Management of Lamps Containing Mercury in Canada* that "most mercury-rich phosphor powder from lamp processing is sent to facilities in the United States that recover the mercury in a pure form."[42] However, experts in the field suggest that mercury recycling via the United States has all but disappeared, and that the loss of this market is connected to the broader international effort to eliminate the production and circulation of elemental mercury.[43]

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[36] Environment and Climate Change Canada, 'Explaining the Environmental Codes of Practice Process' (n 27).

[37] Environment and Climate Change Canda, Code of Practice: Environmentally Sound Management of End-of-Life Lamps Containing Mercury (n 2).

[38] Sonnevera International Corp., 'Review of Requirements for Storage, Transport and Disposal of Mercury Waste in Canada' (2020).

[39] ibid.

[40] Environment and Climate Change Canada, 'Baseline Report' (n 3).

[41] (n 38).

[42] Environment and Climate Change Canada, 'Baseline Report' (n 3).

[43] (n 38).

Therefore, in the absence of a market for reclaimed mercury, PCR indicates in their annual reporting that the mercury and phosphor powder, recovered during the processing of the lamps, are placed in drums that are then encapsulated into a concrete-like material and disposed in a specially engineered landfill in Canada.[44]

[44] Product Care Association of Canada. Prince Edward Island Lights Program 2022 annual report. 2023. www.productcare.org/wp-content/uploads/2023/07/2022-PCA-PEI-Lights-Annual-Report_.pdf.

3. Conclusion

Since the publication of the Strategy in 2019, significant strides have been made towards achieving the Strategy's vision to eliminate lamps as a source of mercury pollution in Canada, including the:

- **Continued decline in mercury containing lamp sales in favour of mercury-free LED alternatives** – lamps containing mercury sales have declined by 79% since their peak sales year as Canadians continue to make the switch to mercury-free LED lamps, resulting in a decrease of 80% in the quantity of mercury found in lamps between 2016 and 2022; industry has noted that the market shift to LEDs has been occurring at a faster rate than initially anticipated.
- **Amendments to the *Products Containing Mercury Regulations* that phase out most lamps containing mercury** – with viable mercury-free and energy efficient lighting alternatives now readily available in the Canadian market, the amendments will phase out exemptions on the manufacture and import of the most common lamps containing mercury used for general lighting purposes as of December 31, 2025.
- **Expansion and enhancement of Extended Producer Responsibility programs for lighting in Canada** – the recent launch of Ontario and Nova Scotia's EPR programs and New Brunswick's upcoming program, combined with the expansion of Manitoba's program to include lamps from the ICI sector have enhanced the recycling collection network and improved accessibility as over 80% of Canadians now live in a jurisdiction with a provincially mandated light recycling program.
- **Recycling of 103 million lamps containing mercury** – based on data collected from the lighting industry, ECCC estimates that, between 2018 and 2022, over 103 million lamps containing mercury were recycled across Canada representing approximately 630 kg of mercury being managed in an environmentally sound manner.
- **Decline in the market for reclaimed mercury** – through domestic and international policies targeting products containing mercury, combined with product innovations in mercury-free energy efficient lighting, the market for recovered mercury has all but disappeared, resulting in the permanent and environmentally sound disposal of mercury in specially designed and secure landfills.

In summary, Canada is on track to achieving the Strategy's vision of eliminating lamps as a source of mercury pollution in Canada. In line with the three goals outlined in the Strategy, policy and product innovations are leading to more Canadians making the switch to mercury-free energy efficient lighting, the majority of Canadians and industry now have access to provincially regulated light recycling programs, and mercury lamp recycling continues to be performed in an environmentally sound manner. This progress is a reflection of efforts across all levels of government, lamp processors, regulatees, PCR, and other key industry stakeholders.

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