

A REVIEW OF THE STATUS OF PRODUCTS IN COMPLIANCE WITH THE MINAMATA CONVENTION ON MERCURY IN MAURITIUS



Mauritius
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This report has been prepared by Mr. Shailand Gunnoo, Consultant, on behalf of the Pesticide Action Network of Mauritius (PANeM).



Disclaimer:

The Consultant acknowledges financial support by the FAO/European Commission via the EEB/ZMWG and PANeM for this report. Sole responsibility for the contents of this document lies with the Consultant.

Moreover, the following points should be noted:

(i) Although efforts have been made to maintain the confidentiality of stakeholders interviewed, including the products sold by some of them, the identity of some public sector institutions is mentioned in the report.

(ii) Every effort has been made to ensure that the data provided in the report does not cause commercial or other prejudice to any stakeholder.

(iii) The use of pictures in the report should, by no means, be construed as providing any endorsement or marketing advantage for any specific product or brand.

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- ❖ Customs Department (Mauritius Revenue Authority)
- ❖ Trading community (importers, distributors, wholesalers, retailers, etc.)
- ❖ Private sector organizations and institutions
- ❖ Local authorities
- ❖ Academic institutions
- ❖ Civil society

ACRONYMS

BP	Blood Pressure
BS	British Standard
CD	Customs Department
CEB	Central Electricity Board
CFL	Compact Fluorescent Lamp
CIF or cif	Cost, insurance and freight
CIS	Centre for Instrumentation Services
COMESA	Common Market for Eastern and Southern Africa
COP	Conference of the Parties
CPA	Consumer Protection Act
CTS	Customs Tariff Schedules
DCCA	Dangerous Chemicals Control Act
DCCB	Dangerous Chemicals Control Bureau
EEB	European Environmental Bureau
EEI	Energy Efficiency Index
EPA	Environmental Protection Agency
ESD	Energy Services Division
EU	European Union
FAO	Food and Agriculture Organization
HCHW	Health Care Without Harm
Hg	Mercury
HS	Harmonized System
IAM	Insurers' Association of Mauritius
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
IMERC	Interstate Mercury Education and Reduction Clearinghouse
ISO	International Organization for Standardization
LED	Light-emitting diode
MACOSS	Mauritius Council of Social Service
MAURITAS	Mauritius Accreditation Service
MCCI	Mauritius Chamber of Commerce and Industry
MEA	Multilateral Environmental Agreement
MGI	Mahatma Gandhi Institute
MIA	Minamata Initial Assessment
MMS	Mauritius Meteorological Services

MoE

Ministry of Social Security, National Solidarity and Environment
and Sustainable Development

ACRONYMS (continued)

MoEHRTESR	Ministry of Education and Human Resources, Tertiary Education and Scientific Research
MoFED	Ministry of Finance and Economic Development
MoHQL	Ministry of Health & Quality of Life
MoICCP	Ministry of Industry, Commerce and Consumer Protection
MoLIRET	Ministry of Labour, Industrial Relations, Employment and Training
MoLG	Ministry of Local Government
MoYS	Ministry of Youth & Sports
MPL	Mauritius Post Limited
MRA	Mauritius Revenue Authority
MSB	Mauritius Standards Bureau
MUR	Mauritian rupee
NAP	National Action Plan
NEWMOA	Northeast Waste Management Association
PAC	Project Advisory Committee
PANeM	Pesticide Action Network Mauritius
pH	Potential of hydrogen
POP	Persistent Organic Pollutant
Ppm	parts per million
RoHS	Restriction of Hazardous Substances (Directive)
SADC	Southern African Development Community
SAICM	Strategic Approach to International Chemicals Management
SDS	Safety Data Sheet
SM	Statistics Mauritius
TEC	Tertiary Education Commission
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UN Environment	United Nations Environment Programme
UoM	University of Mauritius
US	United States
USD	United States dollar
WCO	World Customs Organization
WHO	World Health Organization
ZMWG	Zero Mercury Working Group

EXECUTIVE SUMMARY

Mercury is a chemical of global concern owing to its long-range atmospheric transport, its persistence in the environment, its ability to bioaccumulate in ecosystems, and its significant impacts on human health and the environment. Levels of mercury in the global environment have risen significantly over the past two centuries as a result of increased anthropogenic pollution, much of it from the intentional use of mercury in products.

In 2003, the Governing Council of the United Nations Environment Programme (UN Environment) concluded that mercury is a pollutant of global concern warranting immediate international action, and in 2009 it decided that a legally binding instrument was needed to curtail the global impacts of mercury. After four years of negotiations, the Minamata Convention on Mercury (the “Convention”) was adopted in 2013 in Japan. As the target of 50 ratifications was reached in May 2017, the Convention entered into force on 16 August 2017. Its first Conference of the Parties (COP) was held during the last week of September 2017 in Geneva, Switzerland.

The Convention’s objective is to protect human health and the environment from mercury emissions and releases through a range of voluntary and mandatory measures. In the case of products, a Party to the Convention will not be allowed to manufacture, export or import any mercury-added product listed in Annex A, Part I of the Convention by the end of 2020, unless it registers for an extension as per Article 6 of the Convention.

On 21 September 2017, Mauritius ratified the Convention. The main sources of mercury releases in Mauritius are products-related, as documented in a 2013 national inventory compiled through the Ministry responsible for environment and sustainable development, which hosts the National Focal Point (NFP) of the Minamata Convention.

To facilitate the implementation of the Convention’s provisions on phasing out and phasing-down certain mercury-added products, the Pesticides Action Network Mauritius (PANeM), a local NGO, initiated this study within the framework of a larger project funded by the European Commission through the Food and Agriculture Organization (FAO) via the European Environmental Bureau/Zero Mercury Working Group.

The PANEM project is deemed complementary to the national Minamata Initial Assessment (MIA) undertaken by the NFP with the United Nations Development Programme (UNDP) acting as the Implementing Agency. Launched during the same general time frame as this study, the MIA project, among other things, has refined the mercury inventory for Mauritius.

The purpose of this study was to shed light on the availability and efficacy of mercury-free and other Convention-compliant products (e.g., low-mercury lamps) in the Mauritian

market. The methodology of the study included information gathering and analysis primarily via the following mechanisms: (1) desktop research, (2) survey of relevant products targeting stakeholders such as importers and users of, and (3) field studies/stakeholder interviews.

The study confirms that, since the vast majority of products covered by the Convention are imported into Mauritius, the country generally relies upon global supply sources for Convention-compliant products, and these are widely available. The study also concludes that a complete shift towards Convention-compliant products has not yet taken place in Mauritius. However, based on this research and the experiences of other countries, compliance with the products-related prescriptions detailed in Article 4 of the Convention appears generally achievable in the country by the 2020 target date.

Nevertheless, there will be some challenges in meeting these products-related Convention obligations. One major challenge is the need for improved information collection and monitoring of imported Article 4 goods in Mauritius. There are a number of reasons that the current data is inadequate:

- ❖ The data available at the local Customs authorities often do not differentiate between mercury-added and mercury-free products.
- ❖ As in most such field surveys, response rates to this study were relatively low due to confidentiality issues, lack of time for filling in questionnaires, limited awareness of which products contain mercury, etc.
- ❖ Information pertaining to the efficacy or performance of Convention-compliant products was not provided in many of the responses to the surveys.

Nevertheless, some solid conclusions were able to be drawn from this research. As discussed in Chapter 4, the report concludes that Mauritius can make the transition to Convention-compliant products before the end of 2020, as stipulated in the Convention. Findings concerning specific key sectors include:

- ❖ Mercury-free thermometers and sphygmomanometers are already in use in the health care sector, while the transition to mercury-free laboratory thermometers in the academic sector needs to be further encouraged.
- ❖ No significant challenges regarding availability of mercury-free batteries surfaced during this study; thus compliance with the Convention's 2020 deadline for batteries is feasible. In fact, applicable legislation prohibits the import of batteries with mercury.
- ❖ For the various lighting applications, e.g., street lighting or domestic uses, a slow transition towards Light-Emitting Diode (LED) lamps has been noted. The availability and market price of these lamps are important factors slowing this transition.
- ❖ Pesticides imported into Mauritius are mercury-free.

More detailed information on specific products in Mauritius would be especially useful, such as:

- ❖ the availability of other mercury-free measuring devices listed in Annex A, Part I;
- ❖ the mercury content of the various types of lamps on the market;
- ❖ the availability of mercury-free switches/relays;
- ❖ the mercury content of skin-lightening creams on the market;
- ❖ the extent of use of alternatives to dental amalgams by dental professionals.

In Chapter 5 of the report, a variety of capacity building activities are suggested as next steps to build on recent progress, and to help achieve the objectives of the Convention.

Finally, it is recommended that the Government of Mauritius, through the Ministry of Social Security, National Solidarity, and Environment and Sustainable Development, and other relevant ministries, take further steps over the next few years to facilitate the transition to Convention-compliant products. Such endeavors may include, but not be limited to, additional investigations and consultations, raising awareness, capacity-building, increased regulatory checks, creation and upgrading of databases, and measures engaging relevant stakeholders, particularly those in the commercial sector (“traders”), but in more general terms also encompassing the public sector, the broader private sector and civil society.

1.0 PROJECT SCOPE

1.1 Introduction

Mauritius, a Small Island Developing State, situated off the southeastern coast of Africa, endeavors to protect its natural and marine resources from mercury pollution. The main sources of mercury in the country result from the use and disposal of imported mercury-added products. This was confirmed by the 2013 Mercury Level I Inventory¹ compiled by the Ministry of Environment and Sustainable Development (hereafter referred to as MoE) with the assistance of the UNDP during a national project pertaining to the Strategic Approach to International Chemicals Management (SAICM).²

In early 2016, the national Minamata Initial Assessment (MIA) was launched by the MoE and the UNDP, more or less concurrent with this study.³ The purpose of this study was to shed light on the availability and efficacy of products on the Mauritian market that will be able to meet the provisions of the Minamata Convention on Mercury (“the Convention”) by 2020, and also to outline any challenges presented. The study was also intended to complement the MIA project.

For the purpose of this study, PANeM retained the services of a local consultant working in close collaboration with its international partners, the European Environmental Bureau/Zero Mercury Working Group (EEB/ZMWG). It also established a Project Advisory Committee (PAC) comprising representatives from the UNDP, the Government and Civil Society, to provide general oversight. The composition of the PAC is presented in Appendix II of this report.

The methodology adopted for the study included conducting background research, surveys of stakeholders, field visits and interviews of stakeholders. This is further described in Chapter 3 of this report.

¹ Compiled using the UNEP Toolkit; one of the outputs of the Mauritius SAICM Initiative, a national project on the sound management of chemicals implemented by the Government of Mauritius and the UNDP (2011 - 2014)

² Adopted in 2006, SAICM is an over-arching policy framework advocating the sound management of chemicals with the ultimate aim of minimizing adverse effects to the environment and human health from chemicals by 2020.

³ The study is conducted within the framework of the project entitled: *“Contributing to the preparation/implementation of the Minamata Convention on Mercury, with a focus on developing strategies for phasing out mercury-added products and on reducing mercury use in Artisanal and Small Scale Gold Mining through development of National Action Plans,”* July 2014-December 2017, of the EEB/ZMWG, funded by the European Commission (EC) through the Food and Agriculture Organization (FAO) of the United Nations (UN).

1.2 Minamata Convention on Mercury

Due to ample evidence of the negative effects of mercury⁴ and its compounds on human health⁵ and the environment, in 2009 Governments agreed to start negotiating a legally binding instrument on mercury under the auspices of the United Nations Environment Programme (hereafter referred as “UN Environment”), thus paving the way for an international treaty.

The Minamata Convention on Mercury was signed in 2013 by 128 countries including Mauritius. The objective of this Convention is to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. The Convention therefore includes a range of measures to reduce global mercury pollution by reducing mercury supply and demand, and minimizing releases and emissions of mercury.

By ratifying the Convention, Parties agree that after 2020 they will no longer manufacture, export or import mercury-added products except as permitted by Article 4 and Annex A, unless an exemption is sought as per Article 6. Accordingly, this study is focused on addressing the provisions of Article 4 in their entirety, as no exemption was registered by Mauritius when it ratified the Convention on 21 September 2017.

1.3 Mercury-added products

A mercury-added product is defined by the Convention (Article 2(f)) as a “product or product component that contains mercury or a mercury compound that was intentionally added.” The definition under the Convention is broad as it aims to cover all products to which mercury was added during their manufacturing process in order to provide a specific function or characteristic.

Only those mercury-added products addressed by Article 4 and listed in Annex A of the Convention are subject to extra controls (see full listing in Appendix I). Annex A is split into two parts: Part I (products to be phased out by 2020) and Part II (products to be phased-down, namely dental amalgam). A full list of these products follows:

⁴Mercury is a ‘heavy metal’ due to its high density (13.6 g/cm³) and is the only metal existing in liquid state at room temperature. It is a very good conductor of electricity, easily forms alloys with other metals, and being a liquid under standard conditions, it is sensitive to temperature and pressure. With these physical characteristics and its availability, mercury has been widely used in many products and industrial applications (e.g. as catalyst, electrode or preservative) for many years.

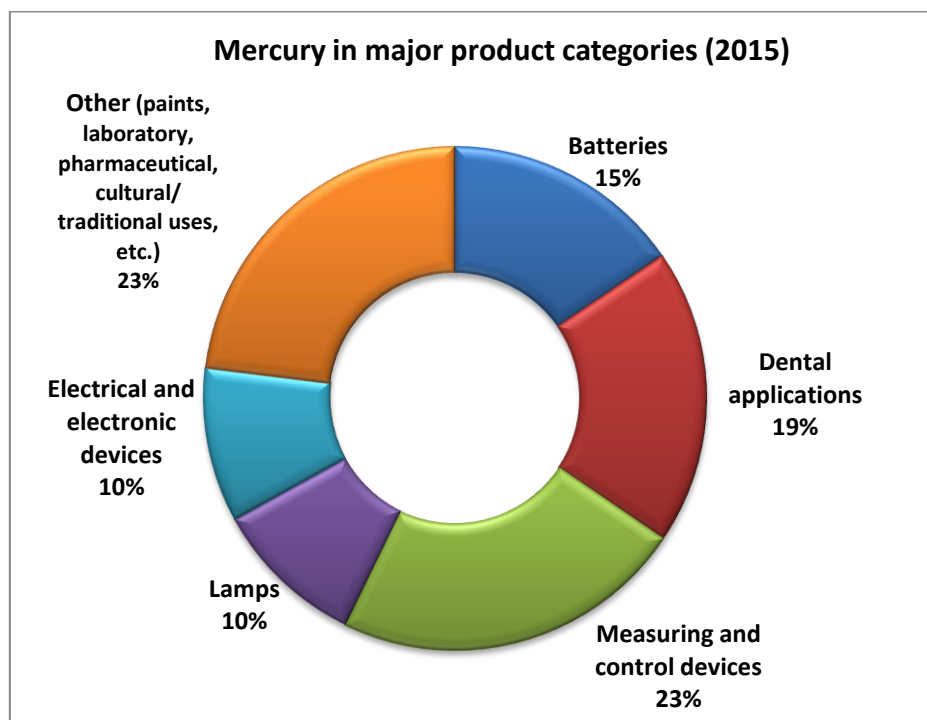
⁵Mercury is classified as a toxic substance. In 2010, the World Health Organisation (WHO) listed mercury among the Top 10 chemicals or groups of chemicals of public health concern.

- ❖ Products listed under Part I of Annex A:
 - Batteries
 - Switches and relays
 - Lamps
 - Cosmetic products
 - Pesticides and Biocides
 - Topical Antiseptics
 - Measuring devices
- ❖ Products listed under Part II:
 - Dental amalgams

In this context, the products listed in Annex A (Part I) will need to comply with the limits and restrictions imposed by the Convention by 2020.

As described in Annex A, not all products need to be replaced by mercury-free alternatives, since some products with reduced mercury levels (e.g., certain types of lamps) would comply with the Convention limits. For this reason, the term ‘Convention-compliant products’ is used in this report to cover such products as well as mercury-free products. Detailed descriptions of these products are provided in Appendix I. Figure 1 below shows a worldwide breakdown of the major product categories containing mercury.

Figure 1: Use of mercury in products



Source: UN Environment (2017). *Global Mercury Supply, Trade and Demand*

For most mercury-added products, cost-effective mercury-free or low-mercury alternatives are already manufactured and used in many countries. Ensuring the availability of Convention-compliant alternatives in Mauritius would thus reinforce the national coordinating mechanisms within the chemicals management infrastructure, and assist the country to comply with its obligations under Article 4 of the Convention.

1.4 Convention-compliant products

The following table lists the main mercury-added products of concern and their Convention-compliant alternatives.

Table 1: Mercury-added products and Convention-compliant alternatives

	Mercury-added products	Convention-compliant alternatives
Batteries	<ul style="list-style-type: none"> • Zn-AgO and Zn-Air with $\geq 2\%$ Hg • Mercuric oxide • Any others with mercury 	<ul style="list-style-type: none"> • Mercury-free Zn-AgO and Zn-Air • Li-Ion (Lithium ion) • Manganese (Alkaline) • Zinc-carbon
Cosmetic products	<ul style="list-style-type: none"> • Skin-lightening soaps > 1 ppm Hg • Skin-lightening creams > 1 ppm Hg 	<ul style="list-style-type: none"> • Cosmetics with trace levels of mercury (< 1 ppm) • Beauty soaps and creams without mercury, e.g., cosmetic products based on natural products, vegetable oils, or essential oil formulations
Lamps	CFLs of power ≤ 30 W with ≥ 5 mg Hg	CFLs of power ≤ 30 W with < 5 mg Hg
	LFLs with triband phosphor of power < 60 W with > 5 mg Hg	LFLs with triband phosphor of power < 60 W with ≤ 5 mg Hg
	LFLs with halophosphate phosphor of power ≤ 40 W with > 10 mgHg	LFLs with halophosphate phosphor power ≤ 40 W with ≤ 10 mg Hg
	CCFLs/EEFLs of length ≤ 500 mm with > 3.5 mg Hg	CCFLs/EEFLs of length ≤ 500 mm with ≤ 3.5 mg Hg
	CCFLs/EEFLs of length between 500 and 1500 mm > 5 mg Hg	CCFLs/EEFLs of length between 500 and 1500 mm ≤ 5 mg Hg
	CCFLs/EEFLs of length > 1500 mm with > 13 mg Hg	CCFLs/EEFLs of length > 1500 mm with ≤ 13 mg Hg
	High pressure mercury vapor (HPMV)	Sodium vapor / High pressure sodium
		Light-emitting diode (LED)
Measuring devices	Barometer	<ul style="list-style-type: none"> • Aneroid • Digital • Fortin
	Manometer	<ul style="list-style-type: none"> • Aneroid • Digital
	Hygrometer	<ul style="list-style-type: none"> • Data loggers

	Mercury-added products	Convention-compliant alternatives
		<ul style="list-style-type: none"> • Digital
	Thermometer	<ul style="list-style-type: none"> • Alcohol / spirit • Electronic and combined for special applications(e.g., data loggers, temperature/conductivity meter, etc.) • Gallium-tin • Infra-red (laboratory) • Standard Platinum Resistance • Tympanic/temporal (clinical)
	Sphygmomanometer	<ul style="list-style-type: none"> • Aneroid • Blood pressure monitors • Digital
Pesticides	Biocides & Pesticides containing mercury	<ul style="list-style-type: none"> • Biocides & Pesticides without mercury, e.g., carbamates, organophosphates, pyrethroids • Biological pesticides
Power devices	Switches & Relays containing mercury	<ul style="list-style-type: none"> • Switches & Relays used in high accuracy instruments with < 20 mg Hg per bridge • Mercury-free relays,*e.g., solid-state relays, electro-mechanical, dry magnetic reeds, etc. • Mercury-free switches,*e.g., mechanical, solid-state, dry magnetic reeds, optical, thermal, etc.
Topical antiseptics	Topical antiseptics containing mercury	<ul style="list-style-type: none"> • Herbal and natural-product antiseptics • Topical antiseptics with active ingredients** like alcohol, benzalkonium chloride, chloroxylonol, Polyvidone iodine, etc. (mercury-free) • Medicated soaps and surface-active agents (mercury-free)
Dental Fillings	Dental amalgams (silver/dark fillings)	<ul style="list-style-type: none"> • Composite fillings (white fillings) • Glass ionomer • Compomer

* Source: NEWMOA/IMERC

**These substances are regulated by various governments, for instance, the United States Food and Drug Administration (FDA).

The common applications and characteristics of these categories of products are further described below.

1.4.1 Batteries

Batteries are used for a wide range of devices such as watches, clocks, cameras, remote controls, hearing aids, toys, calculators and other electronic appliances used by individuals, households, companies, offices, industries, etc. Some of these products (e.g., some button cell batteries) contain added mercury. Mercury-added batteries have been banned from production and trade in many countries.

1.4.2 Cosmetic products

Available in various forms such as sprays, gels, lotions, creams, soaps, powders, etc., cosmetics cover a wide range of products intended for contact with the body. According to Annex A of the Minamata Convention, cosmetic products should not contain more than 1 ppm of mercury. Of particular concern are skin-lightening (or fairness) creams and soaps exceeding that level.

1.4.3 Lamps

Lamps are used for a wide variety of purposes such as in domestic lighting, street lighting, lighting for public places (e.g., parks or sports facilities), advertising panels and billboards, vehicle lights, medical and scientific instruments, maritime navigation systems, airport lights, police and military uses, etc. Although they encompass a broad spectrum of applications, Annex A of the Minamata Convention specifies limits for the mercury content of the most common types of lamps.

1.4.4 Measuring devices

Measuring devices are extensively used in various sectors such as laboratory analysis, environmental monitoring, healthcare, academia, manufacturing, meteorology, agriculture, etc. As mentioned in Table 1, available mercury-free alternatives include alcohol (spirit) thermometers, electronic thermometers, oscillometric sphygmomanometers, etc. Many of these mercury-free measuring devices also conform to industry standards, calibration and other performance-related requirements.

The replacement of mercury-added measuring devices by mercury-free devices has received worldwide attention in some sectors such as in healthcare. Accordingly, the World Health Organization (WHO) and other international groups like Health Care Without Harm (HCWH) have been heavily involved in advocating the shift to mercury-free measuring devices in healthcare facilities. The WHO indeed published a document in 2015 outlining national strategies for phasing out mercury-added thermometers and sphygmomanometers.⁶

⁶ See *Developing National Strategies for Phasing Out Mercury Containing Thermometers and Sphygmomanometers in Health Care, Including in the Context of the Minamata Convention on Mercury*, World Health Organization, 2015. Available at http://www.who.int/ipcs/assessment/public_health/WHOGuidanceReportonMercury2015.pdf?ua=1

Picture 1 below shows mercury-free measuring devices for the healthcare sector.

Picture 1: Mercury-free measuring devices



Source: Importers in Mauritius

1.4.5 Pesticides and biocides

Pesticides are generally classified as agricultural pesticides or non-agricultural (e.g., public health control) pesticides whilst encompassing various sub-categories of products like biocides, fungicides, insecticides, herbicides, etc. These products are subject to strict regulations owing to their potential harm to the environment and human health.

1.4.6 Power devices

For this study, switches and relays, together with thermostats, have been merged into a single group described as ‘Power Devices’. Similar to measuring devices, these power devices may contain elemental mercury for making electrical contact in certain equipment, usually industrial applications.

1.4.7 Topical antiseptics

Topical antiseptics are medical products used for the control of micro-organisms and are applied to injuries and wounds. One of the better known is an organo-metallic complex containing mercury and marketed under the trade name ‘Mercurochrome’, which has been widely used as a topical antiseptic for many years. In some countries this product has been banned for the past 15–20 years due to its mercury content. Yet it may still be available in other countries due to its relatively low cost compared to mercury-free alternatives.

1.4.8 Dental fillings

Dental amalgams are tooth fillings containing about 50% mercury which have been used by dentists for many decades. The physical property of mercury allows it to amalgamate with silver and other metal powders, thereby easily inserted in a properly prepared hole in the tooth. While mercury-free dental fillings such as composites have been widely accepted and

used for a long time, opinions on the need to continue using dental amalgams remain divided in many parts of the world. This explains, at least in part, why a phase-down approach was agreed under the Convention, rather than a phase-out.

2.0 SITUATIONAL ANALYSIS

2.1 Introduction

This Chapter provides information on the current situation regarding mercury-added products, and linkages between some of them and the regulatory mechanisms in place for chemical management in Mauritius. It is important to note that mercury-added products accounted for the majority of mercury releases in Mauritius as evidenced by the mercury Level I Inventory published in 2014.

As an island state, Mauritius relies heavily on imports of various commodities, raw materials and manufactured goods, which *de facto* include mercury-added as well as Convention-compliant products. Belonging to regional groups like the Southern African Development Community (SADC)⁷ and the Common Market for Eastern and Southern Africa (COMESA), Mauritius has special tariffs for trade with countries within these groups and with a few others. The establishment of freeport zones allows imported goods to be readily re-exported without burdensome customs requirements.

For all imported products, categorisation is managed by the Customs Department (CD) through an international classification system adopted by the World Customs Organization (WCO). As explained further in this chapter, the customs data does not provide the level of detail necessary to track mercury-added products and Convention-compliant alternatives through the supply chain.

2.2 Status of mercury-added products in Mauritius

Further to import restrictions on some mercury-added products, Convention-compliant products have increasingly entered the Mauritian market. However, only a few projects dealing with mercury-added products have been conducted in Mauritius, while others have rather focused on general mercury management. For example, one of the partnership areas of the Mercury Assessment Programme (2005 - 2008) looked at managing mercury-added measuring devices (mainly thermometers and sphygmomanometers).

In 2013, a national Mercury Focus Group (MFG) was established for developing a Mercury National Action Plan (NAP) during the Mauritius SAICM Initiative.⁸ Its main output was the

⁷Established in 1992, the SADC is a regional block comprising 15 member states, most of which, like Mauritius, import products of interest to the Convention.

⁸The Mauritius SAICM Initiative was under the overall responsibility of the Ministry of Health & QL, which hosts the SAICM Focal Point for the country and benefited from assistance from the SAICM Quick Start Programme (QSP).

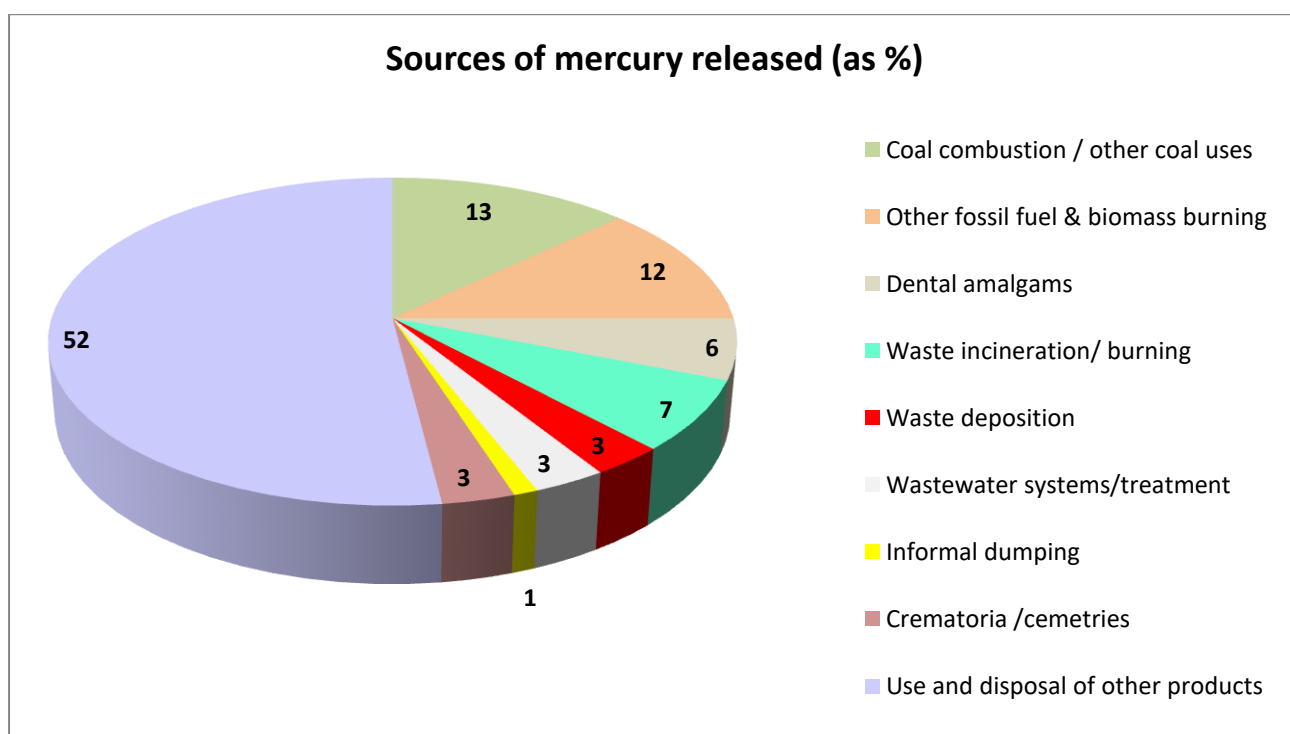
National Chemicals Profile for Mauritius, accompanied by the NAP and the Mercury Level I Inventory.⁹

The MoE and the UNDP were the leading institutions for the NAP and the Mercury Level I Inventory, which gathered inputs from stakeholders under the MFG. Among seven key priority areas for implementing the NAP from 2015 to 2020, 'Priority 4' stipulated the phase-down and phase-out of mercury-added products.

The Mercury Level I Inventory provided estimates of mercury releases in Mauritius. It showed that the 'use and disposal of other products' (including mercury-added products) represented the largest source of mercury releases in the country. By combining mercury releases associated with dental amalgams, waste incineration, open dumping/burning of products and crematorium/cemetery releases, it was estimated that a total of 427.6 kg mercury were released. This aggregated figure was more than twice the releases from combustion sources, mainly coal and biomass, estimated at 179.4 kg mercury for the year 2013.

The main sources of mercury releases in Mauritius, and estimated percentages from the Mercury Level I Inventory are presented in Figure 2 below:

Figure 2: Estimates of mercury releases in Mauritius (2013)



Source: Mercury National Action Plan 2015-2020 / Inventory of Mercury Releases (published in 2014)

⁹The Inventory was compiled using the 'Toolkit for Identification and Quantification of Mercury Releases – Inventory Level I, Version 1.02' (UNEP, April 2013).

2.3 Legal and institutional framework

The Dangerous Chemicals Control Act (DCCA) enacted in 2004 is the main legislation pertaining to chemical substances in Mauritius, and covers such regulatory aspects as the registration, trade, use, transportation, storage and disposal of chemical substances.

The fact that mercury and its compounds are classified as ‘Extremely Dangerous Chemicals’ under the Second Schedule, and mercury compounds are listed as ‘Prohibited Chemicals’ under the Eighteenth Schedule of the DCCA implies very strict legal requirements enforced by the Dangerous Chemicals Control Board (DCCB). However, the legal framework covering mercury-added products is quite limited in Mauritius as compared to other countries though different in size, economy and contexts.

Table 2 presents an overview of legislation of two key trading partners with regard to mercury in products.

Table 2: EU and US laws on mercury and mercury-added products

	Legislation	*Products covered	Remarks
USA	Mercury-containing and Rechargeable Battery Management Act	Batteries	Mercury batteries are banned except in button cells
	Federal Food, Drug and Cosmetic Act	Cosmetics	< 1 ppm Hg, and < 65 ppm Hg (for eye area cosmetics) allowed.
	Mercury-added Product Prohibition Act (State of Illinois and more than ten other states)	Measuring devices and other products	Sales and distribution of mercury-added devices is prohibited
EU	Registration, Evaluation and Authorisation of Chemicals (REACH)	Chemical substances	Mercury used in the manufacture of mercury-added products
	Regulation (EC) No 1223 / 2009 on cosmetic products	Cosmetics	Mercury and its compounds are banned except thiomersal and phenyl mercuric salts (< 0.007% allowed)
	Restriction of Hazardous Substances (RoHS)	Lamps, switches, and other electric / electronic products	< 0.1% Hg by weight in homogeneous materials, specific max. limits set for lamps
	Directive 2006/66/EC as amended on batteries and accumulators	Batteries and button cells	Prohibits all batteries or accumulators, whether or not incorporated into appliances, that contain more than 0,0005% of mercury by weight

**May include products not covered by the Minamata Convention on Mercury.*

Table 3 below shows existing legislation and regulatory institutions in Mauritius for the mercury-added products listed in Annex A.

Table 3: Mercury-added products covered by Mauritian legislation

Mercury-added products	Relevant legislation (if any)	Regulatory institution* (as applicable)
Batteries	Consumer Protection (Control of Imports) Regulations ¹⁰	Commerce Division, MoICCP
Biocides	Dangerous Chemicals Control Act	DCCB
Cosmetics ¹¹ (skin-lightening creams & soaps)	None	Pharmaceutical Services, MoHQL
Lamps (CFLs, LFLs, etc.)	None	None
Measuring devices (non-electronic)	None	None
Pesticides	Dangerous Chemicals Control Act	DCCB
Power devices (switches & relays)	None	None
Topical antiseptics	Pharmacy Act	Pharmaceutical Services, MoHQL
Dental fillings	None	Dental Services, MoHQL

* With regard to the content/composition of the products.

2.3.1 Institutional framework

In Mauritius, key Ministries, parastatal organizations, the private sector and civil society are represented in committees responsible for managing chemicals and chemical products at the national level. The DCCB and the Dangerous Chemicals Advisory Council (DCAC) are both multi-stakeholder frameworks established since 2004 as prescribed by the Dangerous Chemicals Control Act.

Whilst the DCAC reports directly to the Minister responsible for matters of dangerous chemicals, the DCCB is *inter alia* mandated to classify dangerous chemicals and to issue licenses and permits to traders. As per the Third Schedule of the DCCA, various institutions are called upon to act as ‘Enforcing Agencies’ (i.e., entrusted with responsibilities and powers for conducting inspections, monitoring, etc.) for various types of chemicals and chemical products. These institutions and their corresponding responsibilities are shown in Table 4.

¹⁰ As per Government Notice No 160 of 2017, these regulations took effect in August 2017 under the Consumer Protection (Price and Supplies Control) Act.

¹¹ As of December 2017, there is no comprehensive legislation on cosmetics in Mauritius. However, the Pharmacy Act lists mercury as a ‘poison’ and the Pharmacy Board, MoHQL, is called upon to monitor cosmetics liable to contain mercury (e.g. “fairness creams”) despite the fact that these are non-pharmaceutical products.

Table 4: Enforcing agencies under DCCA 2004

Institutions	Key areas of responsibility
Dangerous Chemicals Control Board (DCCB)	<ul style="list-style-type: none"> • Overall planning and coordination • Granting trade permits and licenses • Registration of dangerous chemicals
Ministry responsible for labour affairs	<ul style="list-style-type: none"> • Use and storage of dangerous chemicals at workplaces • Inventories of dangerous chemicals used in workplaces • Investigation of accidents caused by dangerous chemicals
Ministry responsible for health matters	<ul style="list-style-type: none"> • Investigation of occupational diseases, adverse health effects further to exposure to dangerous chemicals • Conducting medical and health surveillance
Ministry responsible for local government affairs	<ul style="list-style-type: none"> • Collection and transport of chemical wastes • Disposal and treatment of chemical wastes
Mauritius Police Force	<ul style="list-style-type: none"> • Road transportation of dangerous chemicals • Emergency planning
Mauritius Fire and Rescue Services	<ul style="list-style-type: none"> • Spreading of dangerous gases, vapors, fumes, etc. • Fires and explosions • Emergency planning
Customs Department	<ul style="list-style-type: none"> • Statistics on types and amounts of traded chemicals • Data exchange on trade of chemicals
Ministry responsible for agricultural affairs	<ul style="list-style-type: none"> • Proper and safe use of pesticides • Control of pesticide residues on plants and vegetables

Source: DCCA 2004

With regard to those products listed in the Minamata Convention, the most significant institutions in Mauritius entrusted with responsibilities are identified in Table 5.

Table 5: Responsibilities of local institutions for products of interest*

Parent institution**	Departments	Responsibilities
Ministry of Social Security and National Solidarity, and Environment and Sustainable Development	<ul style="list-style-type: none"> • Department of Environment • Solid Wastes Division 	<ul style="list-style-type: none"> • National Focal Point of the Minamata Convention • Disposal of hazardous wastes (including mercury products)
Ministry of Health & Quality of Life	<ul style="list-style-type: none"> • DCCB • Pharmaceutical Services • Dental Services Section • Government Analysis Division 	<ul style="list-style-type: none"> • Issues permits for mercury products imported. • Checks /verifications on imported cosmetics • Provision of dental health care • Laboratory testing of cosmetics for mercury content.
Ministry of Industry, Commerce and Consumer Protection	<ul style="list-style-type: none"> • Trade Division • Consumer Affairs Unit • Mauritius Standards Bureau 	<ul style="list-style-type: none"> • Issues import permits for 'Restricted goods' • Protection of consumer rights • Calibration of measuring devices and laboratory testing of cosmetics for mercury content.
Ministry of Finance and Economic Development	<ul style="list-style-type: none"> • Customs Department • Statistics Department 	<ul style="list-style-type: none"> • Clearance of imported goods (with or without checks /verifications) • Maintains data on chemical imports

* Including both mercury-added and mercury-free products

**As of December 2017

As announced in the 2016/2017 National Budget, fiscal measures on mercury-added and alternative products are shown in Table 6 below.

Table 6: Measures in 2016/2017 budget on products of interest

Products	Fiscal measure
Lighting sets	Decrease in customs duty (from 15% to 0%)
Lighting equipment for film-making	Exemption of customs duty
Mercury and metal halide lamps	25% increase in excise duty
Pesticides	15% increase in excise duty
Photovoltaic inverters and batteries	Removal of Value-Added Tax
Primary cells and batteries	Decrease in customs duty (from 15% to 0%)

Source: MoFED

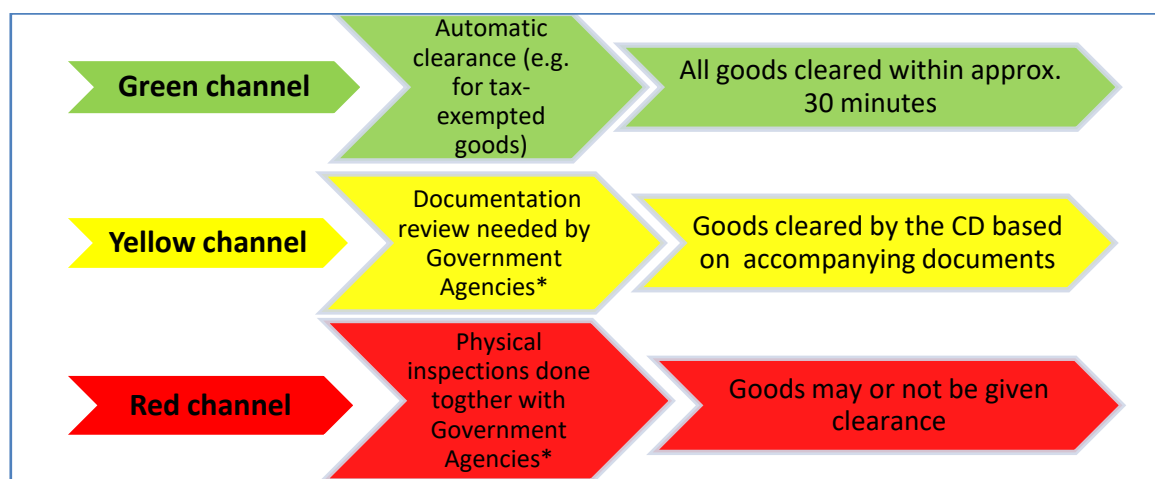
2.4 Imports of mercury-added and Convention-compliant products

2.4.1 Role of the Customs Department

The Customs Department (CD), a specialized entity of the Mauritius Revenue Authority (MRA) is *inter alia* mandated to collect revenue from importers through a Bill of Entry (BoE) for their goods. In addition, any relevant documents such as technical data sheets, compliance certificates, etc., need to be submitted to the CD staff posted at points of entry (i.e., the airport, seaport, and parcel post office). In its regulatory capacity, the CD is thus called upon to facilitate trade, but it also plays a major role in the interdiction of goods not in conformity with applicable legislations.

Customs clearance comprises three channels¹² as depicted in the following chart.

Figure 3: Channels for clearance of imported goods



Source: CD, MRA

*As per Part IV of the Customs Act, these are Ministries and/or their departments, such as the DCCB, Pharmacy Board, Radiation Protection Authority, National Plant Protection Office, etc., depending on the product.

Verifications are conducted on only 5% of all imported goods, but the collaboration between the CD and enforcing authorities is in line with the Customs Act. As illustrated, this mechanism helps to detect imported goods that should be barred from customs clearance until further checks such as laboratory analyses are conducted. The CD is equipped with imaging devices (scanners) both at the airport and the seaport for this purpose.

With regard to mercury and mercury compounds, the DCCB and the Pharmacy Board are the main enforcing agencies engaged with the CD. These substances are more likely to go through the yellow and red channels. However, products containing these substances are

¹²Based on a risk management approach to facilitate trade, the Customs Department has adopted this system for the declaration of all goods at the points of entry into Mauritius.

more likely to be cleared automatically, especially if they are not flagged for control, or when the shipping documents make no mention of mercury content, thus leading to some mercury-added products to be undeclared and eventually reaching selling points.

2.4.2 HS code classification

All products exported and imported globally are subject to an international classification adopted by the World Customs Organization (WCO), namely the Harmonized System (HS) Codes. Accordingly, this classification system is also applicable to mercury-added and Convention-compliant products being traded in Mauritius.

The assigned HS codes emanate from the Customs Tariff Schedules (CTS): Integrated Tariff, an internationally used document devised by the WCO, whose member states are expected to implement their respective requirements. In the WCO classification system, traded commodities are grouped according to pre-defined Chapters (with HS code headings), with subheadings for specific types of products. Thus a certain type of battery, for example, would be identified in shipping documents by its eight- or ten-digit HS code. However, since the HS code system was in place long before the Minamata Convention took effect, for many product categories it does not differentiate between mercury-added and mercury-free versions of the same product. This added to the challenges of interpreting the data obtained from the CD for purposes of identifying mercury-added and Convention-compliant products.

Though of a universal nature, the HS codes vary somewhat with different countries' requirements for imposing excise or other controls on products of interest. Other classification systems¹³ are also used to identify traded commodities. However, since all such systems are used interchangeably, this report will focus only on the HS Codes. The HS codes for products where mercury is specifically mentioned in the current version of the CTS are presented in Table 7 below.

¹³Another classification used, is the Standard International Trade Classification (SITC) developed by the United Nations Statistics Division (UNSD). In this system, eight-digit codes are also used to classify commodities based on groups and subgroups.

Table 7: Mercury products cited in the CTS

Type of product	HS codes	Product Description	Status of product in Annex A of the Convention
Minerals /ores	2620.60	Slag, ash or residues containing mercury or mixtures used for extraction of other metals	Unlisted
Chemical elements	2805.40	Elemental mercury	Unlisted
	2852.10	Organic or inorganic compounds of mercury excluding amalgams	Exempted product
	2852.90		
Electrical machinery and equipment and parts thereof	8539.32	Mercury vapour lamps	Listed in Part I
	85.04	Metal tank mercury arc rectifier	Unlisted
	8506.30	Mercuric oxide batteries	Listed in Part I
	8506.40	Thermionic, cold cathode or photo-cathode valves and tubes, e.g.,mercury arc rectifier valves and tubes	Unlisted

Source: CD, MRA

As mentioned above, not all mercury-added or Convention-compliant products have been assigned a specific HS code in the CTS. For example, the mercury-filled thermometer, a product listed in Annex A of the Convention, falls under HS Code 9025.11. The description for this HS code reads, ‘Liquid-filled thermometer for direct reading’, and is also applicable to other liquid-filled thermometers (for instance, alcohol or spirit-filled thermometers, which are acceptable alternatives to the mercury-added thermometer). Accordingly, more than one specific product may possess the same HS code if its intended use is similar. Other mercury-added or Convention-compliant products are in a similar situation.

Therefore, products listed in Annex A of the Convention may be difficult to identify from the existing customs data. In another example, per the current CTS, the mercury-added sphygmomanometer does not have a specific code; therefore it is likely that import data for this product would be recorded under one of the following categories (with HS Codes in parentheses):

- ‘Instruments and apparatus for medical/surgical sciences’ (9018.9000)
- ‘Instruments and apparatus for medical, surgical, dental or veterinary use’ (9027.8010)
- ‘Instrument/apparatus to measure or check the pressure of liquids /gases’ (9026.2000)
- ‘Other instruments and apparatus’ (9027.8090)

Therefore, without further adaptation of the HS codes, the data currently available from the CD on some of the products of interest may not be adequate for setting a baseline or for evaluating the progress of the transition to Convention-compliant products.

2.4.3 Import statistics

For all goods imported and cleared by customs in Mauritius, the CD compiles trade statistics (for instance, the number of units imported annually, and/or the cif value¹⁴) via the TradeNet Portal.¹⁵ Other institutions such as Statistics Mauritius and the Mauritius Chamber of Commerce and Industry (MCCI) rely on these data. However, these statistics may not separately identify mercury-added products and/or Convention-compliant products, for reasons stated above unless the products are controlled under a specific jurisdiction, e.g., the Excise Act or the Public Health Act. Imported thermometers are controlled in this manner in order to levy a 15% Value Added Tax (VAT).

The available statistics as recorded by the CD may thus be used to obtain aggregated figures for imported products, although different HS codes may sometimes be used for the same product. Accordingly, the data published on the website of the SM were used for compiling the total imported products under the same HS code headings (i.e. with only 2 digits) for the period 2010-2016.

The following table shows the total quantities of products, net weights and cif values as computed for all products of interest (i.e., mercury-added, mercury-free and Convention-compliant ones) from information obtained from the CD. The detailed breakdown for each product category is found in Appendix III of this report.

¹⁴ A term used in global trade indicating that the commodity price includes cost, insurance and freight charges.

¹⁵ Launched on 28 July 1994, TradeNet is a computerized system that allows traders, Customs brokers, shipping agents, and freight forwarders to submit trade documents like manifests, declarations, certificates of origin and import/export permits to various authorities.

Table 8: Aggregated import data for products of interest (2010-2016)

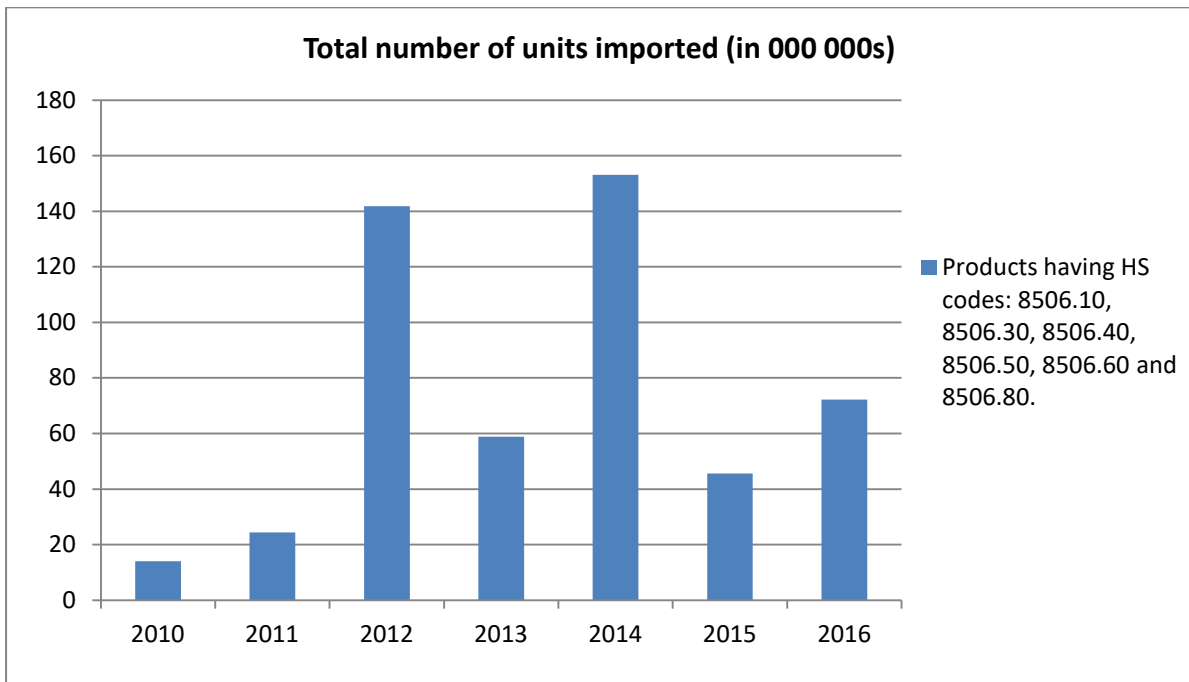
*Product category	Total quantity (units or kg)	Total cif value (MUR)
Batteries	509 814 013 units	1 607 745 719
Cosmetics	62 724 360 kg	8 896 738 013
Lamps	130 357 175 units	1 272 708 173
	203 125 kg	
Measuring devices	6 319 850 units	959 656 380
	21 950 kg	
Pesticides	17 032 735 kg	3 012 897 412
Power devices	1 731 310 units	1 302 665 810
	216 420 units	
Dental amalgams	19 784 kg	50 010 857

Source: CD, MRA

*These cover products falling outside the scope of the Convention, as well as Convention-compliant products.

As evident in Tables 7 and 8, information on these imports is not detailed enough, in most cases, to identify the extent of the ongoing trade in non-Convention-compliant products, or imports of Convention-compliant products. From the available data it has also not been possible to track the ‘topical antiseptics’ that are banned under the Convention. These and alternative antiseptics are likely to be recorded in the CD data along with other pharmaceutical products. Nevertheless, the data can be used to show the annual import trends of a product or product category. As an example, the next figure shows the trends in the number of batteries and primary cells imported into Mauritius for the period 2010-2016.

Figure 4: Annual units of batteries and cells imported



Source:CD, MRA

The above chart shows that there is no reliable trend in the number of batteries imported, although the average number of batteries imported was around 73 000 000 per year. In a similar manner, trends for the other categories of imported products based on HS codes can be worked out from the data summarized in Appendix III.

2.4.4 Product transportation and labeling requirements

Since they are classified as toxic, mercury and its compounds fall under Class 6.1 of the Dangerous Goods Regulations (DGR) established by the UN for transportation safety. Moreover, under the DGR a specific code (UN 3506)¹⁶ is assigned for 'Mercury contained in manufactured articles' and is applied to shipping containers, packaging, shipping manifests and other accompanying documents. Hazard labels shown in the pictures below are typically used for labeling UN 3506 products.

¹⁶The same code is used by the International Air Transport Association (IATA) and the International Maritime Dangerous Goods (IMDG) organization.

Picture 2: Hazard labels for ‘Mercury contained in manufactured articles’



Source: IATA

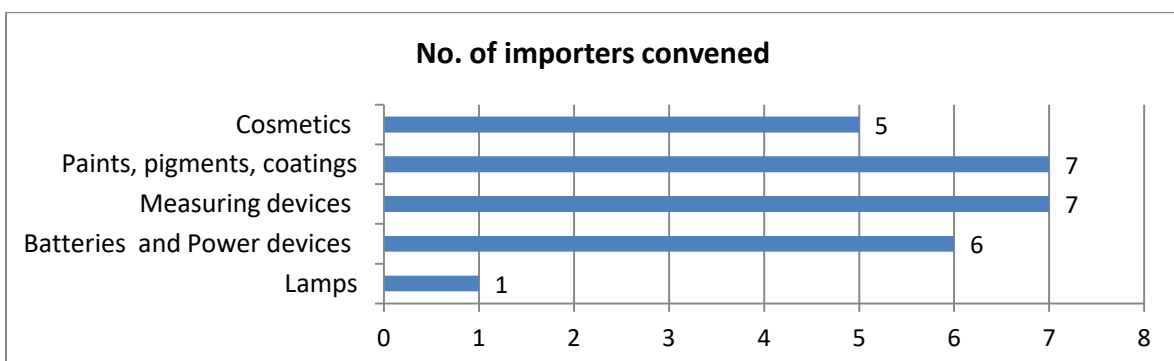
Imports of products classified under the DGR entail additional costs for traders, which may be an incentive for them to import mercury-free products. From other information gathered, there is a preference to use maritime routes for imports as airline companies have increasingly strict limits (in addition to stringent packing requirements) on the types and quantities of ‘DGR-classified’ products transported.

During the study, representatives of various stakeholders involved in the transportation of imported goods, namely Air Mauritius (the national airline company) and private sector entities like shipping companies, freight forwarders, courier service providers and customs agents, were contacted for precise data on the transportation of mercury-added products. It was anticipated that such information might be available via their data management systems. However, these attempts were not fruitful as described in Chapter 3.

2.4.5 Importers’ meeting

For the purpose of the study, various product traders, users and other stakeholders were contacted as potential sources of information. An explanatory meeting with representatives of trading companies of relevant products was organized by the MoE in June 2016. Importers’ representatives at the meeting had an opportunity to learn more about the Convention and its requirements vis-à-vis mercury-added products. Only, 13 representatives (about half the number invited) attended the informative meeting, as summarized in the following chart.

Figure 5: Meeting with representatives of importers



Independent of the above meeting, many more stakeholders were asked for relevant data and/or invited to take part in product surveys within the scope of the study. Additional details are provided in the different sections of Chapter 3.

2.5 Conclusion

With regard to products of interest to the Minamata Convention in Mauritius, gathering additional data directly from traders and users of the respective products may be necessary to determine any transition towards Convention-compliant products, as well as provide an opportunity to learn more about any related challenges.

3.0 METHODOLOGY

3.1 Introduction

In this chapter, the methodology used to conduct the study is presented. Initially desktop research provided a general overview of mercury-added products and Convention-compliant products in Mauritius. This background information was presented at an Inception Workshop in February 2016, which highlighted those mercury-added products that were imported.

After the Inception Workshop, stakeholders were identified in order to obtain more specific data on Convention-compliant products. The core of the study focused on obtaining relevant data from importers, wholesalers, users, etc., via survey questionnaires developed for specific products, and via personal interviews.

This chapter describes the survey process. In order to maintain confidentiality of stakeholders, identification codes were assigned for each product category. Moreover, a color coding system was used to indicate the participation status of each stakeholder for specific surveys.

The surveys covered the main groups of products in Annex A of the Minamata Convention. In order to complement the data search, relevant stakeholders were also contacted directly in some cases (e.g., for lamps). Although details of response rates are given in the current chapter, in-depth findings (such as quantities imported or purchased, financial information, etc.) are discussed in Chapter 4.

3.2 Data search

The Mauritian Customs authorities were among the preliminary stakeholders from whom data were requested on mercury-added and Convention-compliant products. In their regulatory capacity, they maintain official records of all imported goods based on their HS codes. However, as explained in the previous chapter, the customs data on products of interest for the study proved to be mostly generic, and therefore the data could not be easily corroborated with figures obtained through the surveys, as described further in the report.

In order to advance the data gathering process, questionnaires for selected products listed under Article 4 were devised by the Consultant. Some of the questionnaires were generic (e.g., for measuring devices) and others were for specific target groups of stakeholders (e.g., for lamps). The questionnaires were vetted by the EEB and ZMWG, whose inputs were

incorporated. These questionnaires were forwarded to stakeholders (regulatory authorities, traders, distributors and end-users of both mercury-free and mercury-added products in Mauritius) mostly by email. The contact addresses and phone numbers of stakeholders were identified via the internet, the local telephone directory (yellow pages) and personal visits. A cover letter from PANeM (see Appendix IV of the report) was also attached to explain the purpose of the study and provide relevant details.

Further contacts (e.g., emails, phone calls, brief visits) enabled interviews with stakeholders' representatives and/or official presentations, for instance at academic institutions and for Customs Officers. These interactions also contributed to awareness-raising for these respective stakeholders. A few contacts were also established through the MIA project team, for instance, during the meeting with traders held at the MoE in June 2016.

Surveys were conducted from May 2016 (beginning with the measuring devices) until the end of the project, as additional stakeholders were identified. Questionnaire returns from the different target groups reflected a rather low response rate, despite repeated reminders to non-respondents. The response rates from stakeholders rarely exceeded 35% for each category of the surveyed products.

Table 9 lists the different questionnaires developed for the study.

Table 9: Questionnaires developed for the study

Number	Product category	Target group & remarks
I	Measuring devices	Traders (importers, distributors, wholesalers)
II	Measuring devices	End users
III	Measuring devices	MSB (calibration section)
IV	Batteries	Wholesalers, distributors and repair centres of products using batteries
V	Batteries, lamps and power devices	Traders (importers, distributors, wholesalers): Combined group
VI	Lamps	Local authorities (municipalities and district councils)
VII	Lamps	Large users (shopping malls, service providers, public places, etc.)
VIII	Lamps	End users (academic institutions)
IX	Lamps	End users (sports facilities)
X	Lamps	Electrical services providers (lighting)
XI	Lamps	Electronic display sign boards and panel manufacturers
XII	Dental products	Medical insurance providers
XIII	Dental products	Traders (importers, distributors, wholesalers)

However, questionnaires were not always used in the data gathering process. For example, information on cosmetics, pesticides and antiseptics (as listed in Annex A of the Minamata Convention) was obtained through interactions with relevant stakeholders, such as regulatory authorities and during field visits at a few shops/markets. Moreover, such

interactions included some products (e.g., non-domestic paints) which are not listed in Annex A but which may contain mercury or its compounds.

3.3 Survey on measuring devices

Measuring devices, both mercury-added and mercury-free, were the first product category for which questionnaires were developed. These were first targeted to traders and eventually to various end-users for both types of devices. These questionnaires were relatively long as they covered performance-based characteristics such as accuracy, ease of use, ease of calibration, response time or reliability of results. Other criteria (e.g. market availability of the devices or their spare parts, assistance from supplier/manufacturer, training of users) also featured in the questionnaire to assess the devices. It was hoped that respondents would be able to provide such data together with details of quantities imported or purchased. For broader coverage, other end-users were also contacted, as described below.

3.3.1 Questionnaires for traders

Questionnaires were sent to 30 trading companies after establishing contact with representatives (i.e., importers, wholesalers, distributors, retailers, etc., of the measuring devices mentioned in Chapter 1). For this survey, the response rate was reasonable, but lower than hoped for. After several reminders, out of the 30 questionnaires sent, 9 were returned as completed or partly completed, while one trader merely reported figures imported, thus representing a 30% response rate. The participation of the traders is shown in Table 10 below.

Table 10: Survey participation for traders of measuring devices

	Stakeholder type	Ref. code	*Status		Stakeholder type	Ref. code	*Status
1	Importer	TMD/1	Green	16	Importer	TMD/16	Yellow
2	Importer	TMD/2	Yellow	17	Importer	TMD/17	Yellow
3	Importer	TMD/3	Green	18	Wholesaler	TMD/18	Red
4	Importer	TMD/4	Green	19	Wholesaler	TMD/19	Green
5	Importer	TMD/5	Yellow	20	Importer	TMD/20	Green
6	Importer	TMD/6	Yellow	21	Importer	TMD/21	Red
7	Importer	TMD/7	Green	22	Wholesaler	TMD/22	Green
8	Importer	TMD/8	Yellow	23	Wholesaler	TMD/23	Yellow
9	Importer	TMD/9	Green	24	Importer	TMD/24	Green
10	Importer	TMD/10	Yellow	25	Wholesaler	TMD/25	Yellow
11	Importer	TMD/11	Yellow	26	Wholesaler	TMD/26	Red
12	Wholesaler	TMD/12	Yellow	27	Importer	TMD/27	Yellow
13	Importer	TMD/13	Yellow	28	Importer	TMD/28	Blue
14	Importer	TMD/14	Yellow	29	Importer	TMD/29	Yellow
15	Importer	TMD/15	Yellow	30	Importer	TMD/30	Yellow

*Status as of 31 December 2017 whereby:

- Red is for traders who refused to take part in the survey.
- Blue is for traders who only provided information but no questionnaire.
- Yellow is for traders who did not reply despite several reminders.
- Green is for traders who sent back a partly or completely filled questionnaire.

3.3.2 Questionnaires for users

Users of measuring devices from various governmental laboratories (Ministries and Parastatals), private laboratories, private companies equipped with an analytical laboratory, healthcare facilities, animal health facilities, academic and research institutions were contacted and sent survey questionnaires. Since it was impossible to obtain information from all users of measuring devices in Mauritius, representative users within the various sectors were therefore contacted.

A total of 86 questionnaires were sent to user institutions and 30 of them sent back a fully or partially completed questionnaire. Moreover, some of the user institutions did not send back the questionnaire but gave only a brief indication of the types and numbers of devices they currently possess. Further details of these user institutions are presented in Table 11, indicating a 34.9% response rate.

Table 11: Survey participation for users of measuring devices

	Stakeholder type	Sector / area	User code	* Status		Stakeholder type	Sector / area	User code	* Status
1	Laboratory	Environment	UMD/GS/1	Green	44	Private institution	Healthcare	UMD/PS/8	Yellow
2	Laboratory	Fisheries	UMD/GS/2	Green	45	Private institution	Healthcare	UMD/PS/9	Yellow
3	Laboratory	Jewelry	UMD/GS/3	Green	46	Private institution	Healthcare	UMD/PS/10	Yellow
4	Laboratory	Metrology	UMD/GS/4/1	Green	47	Private institution	Healthcare	UMD/PS/11	Green
5	Laboratory	Chemical testing	UMD/GS/4/2	Green	48	Private institution	Healthcare	UMD/PS/12	Yellow
6	Laboratory	Material testing	UMD/GS/4/3	Green	49	Private institution	Healthcare	UMD/PS/13	Yellow
7	Laboratory	Chemical testing	UMD/GS/5	Green	50	Private institution	Healthcare	UMD/PS/14	Red
8	Laboratory	Forensic science	UMD/GS/6	Yellow	51	Private institution	Healthcare	UMD/PS/15	Green
9	Laboratory	Chemical testing	UMD/GS/7	Yellow	52	Private institution	Healthcare	UMD/PS/16	Yellow
10	Laboratory	Chemical testing	UMD/GS/8	Green	53	Private institution	Healthcare	UMD/PS/17	Yellow
11	Laboratory	Food testing	UMD/GS/9	Yellow	54	Private lab.	Chemical testing	UMD/PS/18	Yellow
12	Laboratory	Material testing	UMD/GS/10	Yellow	55	Private lab.	Chemical testing	UMD/PS/19	Yellow
13	Laboratory	Material testing	UMD/GS/11	Yellow	56	Private lab.	Chemical testing	UMD/PS/20	Yellow
14	Laboratory	Meteorology	UMD/GS/12	Yellow	57	Private lab.	Chemical testing	UMD/PS/21	Yellow
15	Laboratory	Water testing	UMD/GS/13	Green	58	Private lab.	Chemical testing	UMD/PS/22	Yellow
16	Laboratory	Water testing	UMD/GS/14	Yellow	59	Private lab.	Chemical testing	UMD/PS/23	Yellow
17	Parastatal	Agriculture	UMD/GS/15	Yellow	60	Private lab.	Chemical testing	UMD/PS/24	Yellow
18	University Dep't	Academia	UMD/AS/1/1	Green	61	Private company	Food production	UMD/PS/25	Yellow
19	University Dep't	Academia	UMD/AS/1/2	Green	62	Private company	Food production	UMD/PS/26	Blue
20	University Dep't	Academia	UMD/AS/1/3	Green	63	Private company	Food production	UMD/PS/27	Red
21	University Dep't	Academia	UMD/AS/1/4	Green	64	Private company	Food production	UMD/PS/28	Yellow
22	University Dep't	Academia	UMD/AS/1/5	Green	65	Private company	Food production	UMD/PS/29	Yellow
23	University Dep't	Academia	UMD/AS/1/6	Green	66	Private company	Beverage production	UMD/PS/30	Yellow
24	Medical School	Academia	UMD/AS/2	Green	67	Private company	Beverage production	UMD/PS/31	Yellow
25	Medical School	Academia	UMD/AS/3	Red	68	Private company	Beverage production	UMD/PS/32	Yellow
26	University	Academia	U/MD/AS/4	Yellow	69	Private company	Food distribution	UMD/PS/33	Yellow
27	University	Academia	UMD/AS/5	Yellow	70	Private company	Textile production	UMD/PS/34	Yellow
28	Medical School	Academia	UMD/AS/6	Yellow	71	Private company	Textile production	UMD/PS/35	Yellow
29	Training School	Academia	UMD/AS/7	Yellow	72	Private company	Soap / cosmetic production	UMD/PS/36	Green
30	Private School	Academia	UMD/AS/8	Blue	73	Private company	Soap & detergent	UMD/PS/37	Green
31	Gov't institution	Academia	UMD/GS/16	Green	74	Private company	Soap /detergentprod.	UMD/PS/38	Yellow
32	Parastatal body	Academia	UMD/AS/9	Yellow	75	Private company	Glue/adhesive production	UMD/PS/39	Red
33	Private institution	Academia	UMD/AS/10	Green	76	Private company	Paint production	UMD/PS/40	Green
34	Research lab.	Academia	UMD/RS/1	Blue	77	Private company	Paint production	UMD/PS/41	Yellow
35	Research lab.	Marine science	UMD/RS/2	Blue	78	Private company	Paint production	UMD/PS/42	Green
36	Medical lab.	Healthcare	UMD/PS/1	Yellow	79	Private company	Sugar production	UMD/PS/43	Yellow
37	Medical lab.	Healthcare	UMD/PS/2	Red	80	Private company	Sugar production	UMD/PS/44	Yellow
38	Medical lab.	Healthcare	UMD/PS/3	Blue	81	Private company	Sugar production	UMD/PS/45	Yellow
39	Medical lab.	Healthcare	UMD/PS/4	Yellow	82	Private company	Petroleum productsdistrib.	UMD/PS/46	Yellow
40	Medical lab.	Healthcare	UMD/PS/5	Green	83	Veterinary clinic	Animal care	UMD/PS/47	Yellow
41	Medical lab.	Healthcare	UMD/PS/6	Yellow	84	Veterinary clinic	Animal care	UMD/PS/48	Green
42	Gov't institution	Healthcare	UMD/GS/17	Yellow	85	Veterinary clinic	Animal care	UMD/PS/49	Yellow
43	Private institution	Healthcare	UMD/PS/7	Green	86	Zoo / Animal park	Animal care	UMD/PS/50	Green

* Status of users as of 31 December 2017 whereby:

- Red is for users who refused to take part in the survey.
- Blue is for users who provided some information but no questionnaire.
- Yellow is for users who did not reply despite several reminders.
- Green is for users who sent back a partly or fully completed questionnaire.

3.4 Survey on batteries

In Mauritius, 'Batteries with mercury' are listed among prohibited goods as per the Consumer Protection (Control of Imports) Regulations 2017 under the CPA. Therefore, mercury-added batteries cannot be imported legally. However, a survey on batteries was conducted so as to obtain relevant data from stakeholders. The survey was targeted at traders of batteries as well as distributors, and repair centers for devices and appliances that are battery operated (e.g., watches & clocks).

3.4.1 Questionnaires on batteries

The survey questionnaire initially intended to obtain information on battery imports was merged into a larger questionnaire for traders of lamps and power devices. The reason for this was the existence of companies involved in the trading of more than one of these types of products. However, only two trading companies that import batteries responded to the survey questionnaires. They provided quantitative information on the batteries imported, as both are authorized brand importers' representatives in Mauritius. They were assigned the codes TB/1 and TB/2 respectively in the survey.

Forty-four survey questionnaires were also sent to users/distributors of batteries, and distributors and repair centres of battery-operated devices. This survey received 13 responses for a response rate of 29.5%.

Table 12 provides further details on the survey participation for these stakeholders.

Table 12: Survey participation of users and distributors of batteries

No	Stakeholder type	Accessories / products for which batteries are used	Ref. Code	*Status
1	Distributor & repair centres	Watches and clocks	WCDR/B/1	Yellow
2	Distributor & repair centres	Watches and clocks	WCDR/B/2	Green
3	Distributor & repair centres	Watches and clocks	WCDR/B/3	Green
4	Distributor & repair centres	Watches and clocks	WCDR/B/4	Yellow
5	Distributor & repair centres	Watches and clocks	WCDR/B/5	Green
6	Small-size retailers & repair centres	Watches and clocks	WCSR/B/1	Yellow
7	Small-size retailers & repair centres	Watches and clocks	WCSR/B/2	Yellow
8	Small-size retailers & repair centres	Watches and clocks	WCSR/B/3	Green
9	Small-size retailers & repair centres	Watches and clocks	WCSR/B/4	Green
10	Small-size retailers & repair centres	Watches and clocks	WCSR/B/5	Green
11	Small-size retailers & repair centres	Watches and clocks	WCSR/B/6	Red
12	Small-size retailers & repair centres	Watches and clocks	WCSR/B/7	Green
13	Small-size retailers & repair centres	Watches and clocks	WCSR/B/8	Yellow
14	Small-size retailers & repair centres	Watches and clocks	WCSR/B/9	Red
15	Small-size retailers & repair centres	Watches and clocks	WCSR/B/10	Green
16	Private health-care institution	Hearing aids	HAPI/B/1	Yellow
17	Private health-care institution	Hearing aids	HAPI/B/2	Yellow
18	Private health-care institution	Hearing aids	HAPI/B/3	Green
19	Photo studio	Cameras, flashes, etc	CFPS/B/1	Yellow
20	Photo studio	Cameras, flashes, etc	CFPS/B/2	Yellow
21	Photo studio	Cameras, flashes, etc	CFPS/B/3	Yellow
22	Photo studio	Cameras, flashes, etc	CFPS/B/4	Green
23	Telecommunication company	Mobile phones& accessories	MPTC/B/1	Yellow
24	Telecommunication company	Mobile phones& accessories	MPTC/B/2	Yellow
25	Electronic retail shop	Various appliances	VAER/B/1	Yellow
26	Electronic retail shop	Various appliances	VAER/B/2	Yellow
27	Electronic retail shop	Various appliances	VAER/B/3	Yellow
28	Electronic retail shop	Various appliances	VAER/B/4	Green
29	Electronic retail shop	Various appliances	VAER/B/5	Yellow
30	Electronic retail shop	Various appliances	VAER/B/6	Yellow
31	Small-sized retail shop	Various appliances	VASRS/B/1	Green
32	Small-sized retail shop	Various appliances	VASRS/B/2	Yellow
33	Small-sized retail shop	Various appliances	VASRS/B/3	Yellow
34	Small-sized retail shop	Various appliances	VASRS/B/4	Yellow
35	Large distributor & retailer	Electronic toys	ETLR/B/1	Yellow
36	Large distributor & retailer	Electronic toys	ETLR/B/2	Yellow
37	Supermarket chain	Various appliances	VASC/B/1	Yellow
38	Supermarket chain	Various appliances	VASC/B/2	Red
39	Supermarket chain	Various appliances	VASC/B/3	Yellow
40	Large distributor & retailer	Electronic appliances	EALR/B/1	Green
41	Large distributor & retailer	Electronic appliances	EALR/B/2	Red
42	Large distributor & retailer	Electronic appliances	EALR/B/3	Yellow
43	Large distributor & retailer	Electronic appliances	EALR/B/4	Yellow
44	Large distributor & retailer	Electronic appliances	EALR/B/5	Yellow

*Status as of 31 December 2017 whereby:

- Red is for stakeholders who refused to take part in the survey,
- Yellow is for stakeholders who did not reply despite several reminders.
- Green is for stakeholders who sent back a partly or fully completed questionnaire.

The findings of the above surveys and related discussions are found in Section 4.3 of the report.

3.5 Survey on lamps

Lamps are the most commonly used mercury-added products in Annex A of the Minamata Convention. As described in Chapter 1, they cover a wide range of applications and are used in various settings such as public buildings, streets, offices, sports facilities, residential places, etc. Accordingly, the surveys targeted various groups of stakeholders.

3.5.1 Questionnaires on lamps

A first survey on lamps was conducted to gather details on the different types imported into Mauritius. The survey targeted importers of lamps through the combined questionnaire on lamps, batteries and power devices. In order to facilitate data gathering, the questionnaire focused on technical details of lamps to be phased out by the Convention. Twenty (20) importers and wholesalers of different types of lamps representing various brands were identified for the survey. Despite several reminders, only two of the traders provided feedback, representing a response rate of 10%.

In addition to traders, sector-based questionnaires were sent to different categories of end-user such as local authorities (District and Municipal Councils), shopping malls, academic institutions, sports facilities and other public places, etc. These were chosen based on factors like the size of the organization or facility, anticipated numbers of lamps used per facility, or lamp usage over a 24-hour period. A total of 44 stakeholders were contacted including two public institutions under the Ministry of Energy and Public Utilities (MoEPU). Only 9 users responded with questionnaires partly or fully completed, representing a response rate of 20.5%.

Table 13 provides details of the participation of these stakeholders.

Table 13 : Survey participation for users of lamps

No	Stakeholder type	User Code	*Status	No	Stakeholder type	User Code	*Status
1	Public sector	UL/PS/1	Yellow	23	Service provider	UL/SP/4	Yellow
2	Public sector	UL/PS/2	Yellow	24	Service provider	UL/SP/5	Yellow
3	City Council	UL/LA/1	Blue	25	Shopping mall	UL/SM/1	Yellow
4	Municipal Council	UL/LA/2	Yellow	26	Shopping mall	UL/SM/2	Yellow
5	Municipal Council	UL/LA/3	Yellow	27	Shopping mall	UL/SM/3	Yellow
6	Municipal Council	UL/LA/4	Green	28	Shopping mall	UL/SM/4	Yellow
7	Municipal Council	UL/LA/5	Blue	29	Shopping mall	UL/SM/5	Yellow
8	District Council	UL/LA/6	Yellow	30	Shopping mall	UL/SM/6	Yellow
9	District Council	UL/LA/7	Green	31	Shopping mall	UL/SM/7	Yellow
10	District Council	UL/LA/8	Yellow	32	Shopping mall	UL/SM/8	Yellow
11	District Council	UL/LA/9	Green	33	Shopping mall	UL/SM/9	Yellow
12	District Council	UL/LA/10	Green	34	Shopping mall	UL/SM/10	Yellow
13	District Council	UL/LA/11	Yellow	35	Academic institution	UL/AI/1	Yellow
14	District Council	UL/LA/12	Yellow	36	Academic institution	UL/AI/2	Yellow
15	Parastatal body	UL/PB/1	Yellow	37	Academic institution	UL/AI/3	Yellow
16	Parastatal body	UL/PB/2	Yellow	38	Academic institution	UL/AI/4	Green
17	Parastatal body	UL/PB/3	Green	39	Academic institution	UL/AI/5	Blue
18	Parastatal body	UL/PB/4	Green	40	Academic institution	UL/AI/6	Yellow
19	Parastatal body	UL/PB/5	Yellow	41	Academic institution	UL/AI/7	Green
20	Service provider	UL/SP/1	Green	42	Academic institution	UL/AI/8	Yellow
21	Service provider	UL/SP/2	Yellow	43	Private contracting firm	UL/PC/1	Yellow
22	Service provider	UL/SP/3	Yellow	44	Private contracting firm	UL/PC/2	Yellow

*Status as of 31 December 2017:

- Blue is for users who only provided some information but no questionnaire.
- Yellow is for users who did not reply despite several reminders.
- Green is for users who sent back a partly or fully completed questionnaire.

Each of the stakeholders chosen for the above survey is a large user, in comparison to a small or domestic user of typically only three to five lamps. Survey questionnaires were also sent to two parastatal organizations within the energy sector in Mauritius, namely the Central Electricity Board (CEB) and the Energy Services Division (ESD) falling under the MoEPU, as well as private contracting companies (infrastructure service providers). Only the ESD submitted a completed questionnaire.

A final survey was conducted on lamps for electronic displays. It targeted 12 local companies that provide lighting and advertising services, of which 10 were manufacturers of electronic sign boards and panels for advertising purposes. Two events companies using lamps for shows, concerts and similar purposes were also contacted.

The findings and discussions of the above surveys on lamps are found in Section 4.4.

3.6 Survey on power devices

Switches and relays, two of the listed products in Part I of Annex A, together with thermostats, have been merged into a single group referred to as 'Power devices' for this survey. These devices are used for electrical contacts in specific installations, usually for industrial applications. For these products, the identified traders included the same ones contacted for the survey on lamps, i.e., with the same identification codes. Less than ten such companies were thus sent the combined questionnaire as described before, but none of them responded despite several reminders.

With regard to the users of power devices, only a few stakeholders were contacted. These users were chosen on the basis of their type of electrical installations and the number of years they have been established in Mauritius. No questionnaires were developed for the users within this target group. Personal visits were undertaken and emails sent to inquire on the status of their power devices. For practical reasons, no user identification codes were assigned to them. The chosen users were power producers including the CEB, which is the only official public sector authority producing and distributing electricity in Mauritius, sugar milling factories, distilleries and construction companies. However, little information was received from these stakeholders, as explained in Section 4.5 of the report.

3.7 Survey on dental amalgams

As mentioned in Chapters 1 and 2, the Convention requires a phase-down for dental amalgams whilst encouraging the use of mercury-free alternatives. The nine phase-down measures for consideration of Parties to the Convention are listed in Appendix I of this report.

For the period 2014–2015, Mauritius had an average of 3.0 dentists per 10 000 inhabitants (Statistics Mauritius). Dental treatment is offered at major hospitals, dental clinics operating on a regional basis, private healthcare or dental facilities, as well as dentists practicing on their own. Being the largest user of dental fillings, the MoHQL usually calls for open bidding (i.e., tender applications) for their procurement needs. These tenders are either awarded to dental suppliers or to trading companies that also import other medical or laboratory products. Three questionnaires were devised for the dental sector.

3.7.1 Questionnaires on the dental sector

The first survey questionnaire targeted companies and private dentists involved in the import and/or distribution of dental amalgams and their alternatives. Fewer than ten of these stakeholders were identified, of which four responded with a partially or fully completed questionnaire, and all were assigned identification codes, as in Table 14 below.

Only one respondent was involved exclusively in the import and distribution of dental products.

The second questionnaire was devised to gather data on the nine amalgam phase-down measures listed in the Convention that could be taken by the Government of Mauritius. This questionnaire was submitted only to the Dental Services section of the MoHQL, which is the regulatory/enforcing institution for dental healthcare in Mauritius. In addition, there were some communications with a few representatives of the Medical and Dental Council of Mauritius, the Association of Private Dentists and some other private dentists.

The third questionnaire was devised for insurance companies providing health/medical schemes in Mauritius, in view of obtaining information linked with the two measures on medical insurance policies in Part II of Annex A. The questionnaire was sent to five insurance companies. The Insurers' Association of Mauritius (IAM) and a medical insurance association were contacted to encourage greater participation among their members, but only three insurance companies provided some information. Other data of interest to the study, such as the numbers of patient claims for dental amalgams vs. alternative fillings, were not specifically recorded by the insurers.

Table 14 summarizes the responses to the dental product survey.

Table 14: Survey participation of stakeholders for dental products

	Stakeholder	Code	Status*
1	Importer of dental products	T/DF/1	Green
2	Private dentist	T/DF/2	Green
3	Private dentist	T/DF/3	Green
4	Private dentist	T/DF/4	Green
5	Importer of dental and other medical products	T/DF/5	Yellow
6	Importer of dental and other medical products	T/DF/6	Yellow
7	Insurance company	MIP/1	Blue
8	Medical insurance company	MIP/2	Green
9	Insurance company	MIP/3	Yellow
10	Insurance company	MIP/4	Yellow
11	Insurance company	MIP/5	Red

*Status as of 31 December 2017, where:

- Red is for stakeholders who refused to take part in the survey.
- Blue is for stakeholders who provided some information but no filled questionnaire.
- Green is for stakeholders who sent back a partly or fully completed questionnaire.
- Yellow is for stakeholders who did not reply despite several reminders.

The findings of these surveys, together with additional information gathered from the literature review, is presented in Section 4.6 of this report.

3.8 Other products

As mentioned earlier, survey questionnaires were not devised for all of the products listed in Annex A of the Minamata Convention. However, information was gathered on these products through documentation reviews and various exchanges such as meetings, discussions, etc., with stakeholders. Contacts are discussed in this section of the report, while findings are presented in Chapter 4.

3.8.1 Cosmetics

There are currently very few cosmetic manufacturing companies in Mauritius, and these do not use raw materials containing mercury, according to the information of the DCCB. Comprehensive legislation for cosmetics in Mauritius does not exist at this time. The current enforcing institution, as described in Chapter 2, is the Pharmaceutical Services under the MoHQL. It is responsible for ensuring the quality of these products, including imported products, and works in collaboration with the CD for undertaking verifications of imported cosmetics. Accordingly, some data were gathered from these institutions.

The Clinical Trial Act enacted in 2011 also applies to locally made cosmetics, thereby mandating best practice (such as Good Clinical Practice). The study revealed a lack of adequate testing capacity for cosmetic products in Mauritius, as very few laboratories were found capable of analysing such products for their mercury levels. In parallel to the study, imported cosmetic products, mainly creams, were purchased in the local market by PANeM and sent for analysis in the United States.

3.8.2 Pesticides and biocides

Pesticides may be classified as agricultural and non-agricultural (e.g., pesticides used for public health control). They include various sub-categories of products like biocides, fungicides, insecticides, herbicides, etc. These products are under strict regulations owing to their risk to the environment and to human health, especially in case of excessive use.

No survey was carried out on pesticides (including biocides) during the study. However, from information obtained from the DCCB, no mercury-added pesticides have been imported by Mauritius since 2004. Prior to the DCCB, the Pesticides Control Board also did not allow any imports of mercury-added pesticides into Mauritius. Some paints, pigments and similar products are known to contain compounds of heavy metals like lead, chromium, etc. It is known that paints used for the automobile, ship-building and related industries, as well as those used for road markings and traffic signs, may also contain hazardous ingredients, including mercury in some cases.

3.8.3 Topical antiseptics

Listed in Part I of Annex A of the Convention, topical antiseptics containing mercury are to be banned by 2020. The Pharmacy Division of the MoHQL was contacted for information on topical antiseptics imported into Mauritius (i.e., no survey was conducted). In addition, some pharmacies (chemist shops) were visited and inquiries were made about the availability of these products.

3.9 Challenges for the study

In addition to the challenges presented for non-specific HS codes for the various products, as described in Section 2.4 of the report, other types of challenges were also encountered with regard to preliminary findings from the surveys conducted. These are listed below in no particular order of importance.

- Many stakeholders, especially traders, were not aware of the presence or amounts of mercury in their products. Most were not aware of the risks presented by mercury on health and the environment and their representatives had to be briefed during interactions intended to gather data.
- The surveys were purely voluntary and the contacted stakeholders were not under any obligation to participate.
- Representatives of the stakeholders often wanted to discuss details of the study and its expectations. This process turned out to be time-consuming, especially when these explanations had to be repeated to different persons representing the same stakeholders.
- In general, the response rates were lower than hoped. Several reminders had to be sent to the stakeholders to participate in the respective surveys. Reasons behind the low response rates could be linked to confidentiality issues, fear of revealing any sensitive information to competitors or other stakeholders, lack of time for filling in questionnaires, etc.
- In some cases stakeholders only provided an indication of their products by email or phone, and did not wish to fill in the questionnaire. This was the case for some users of measuring devices in particular, as they commented only on the types and numbers of products they possess.
- In general, computerized data on products of interest was unavailable, and stakeholders had to undertake manual searches in documents like technical data sheets, sales receipts or other records to retrieve key information, which was more time-consuming.
- In many cases, quantitative information provided by respondents, such as the number of products imported per year, were estimates.
- Some of the respondents did not complete the survey questionnaire entirely but rather submitted a partially completed survey.

- In some cases, despite the written and verbal explanations given, some stakeholders were under the impression that PANeM was trying to encourage the phase-out of their traded products (i.e., cause prejudice to their business.) This led to their refusal to participate.
- The accuracy of the information gathered from the surveys was difficult to verify; lacking evidence to the contrary, it was assumed that the data received was generally accurate and free from bias or errors.
- For many of the surveys, key information pertaining to the efficacy and performance of Convention-compliant products was not provided in the responses received from the various target groups.
- Above all, a lack of knowledge of the Convention, its requirements *vis-à-vis* the listed mercury-added products, as well as the specifications of Convention-compliant products, was noted especially for the private sector stakeholders.

3.10 Conclusions

In summary, a range of stakeholders involved in the trade, distribution and use of specific products of interest were asked to fill out surveys and provide information. In spite of the fact that Mauritius is a small country, gathering data for this study was not easy as anticipated. Due to a variety of factors, there was a relatively low response rate to the surveys and less feedback than desired. Together with inputs received from the feedback from respondent stakeholders and further analyses, the next Chapter presents what is known about the status of the mercury-added and Convention-compliant products in the country.

4.0 FINDINGS AND DISCUSSION

4.1 Introduction

The focus of the study was to determine the extent of the transition towards Convention-compliant products in Mauritius, and the possibility of reaching that objective by 2020. The data gathering process included outreach to a variety of stakeholders for the various products of interest. However, a rather low response level was observed for all surveys undertaken as described in Chapter 3. Additional data on some products were obtained via desktop research, especially for the non-surveyed products. Overall, sufficient data was collected to confirm that the transition to Convention-compliant products has not yet been achieved for Mauritius.

This chapter presents the feedback received from surveys conducted. An in-depth analysis for each product category on a sector basis also features in the discussions in more detail, in view of a better understanding of the current situation for the various products in Mauritius. However, there is not sufficient information to cover all of the products at the same level of detail.

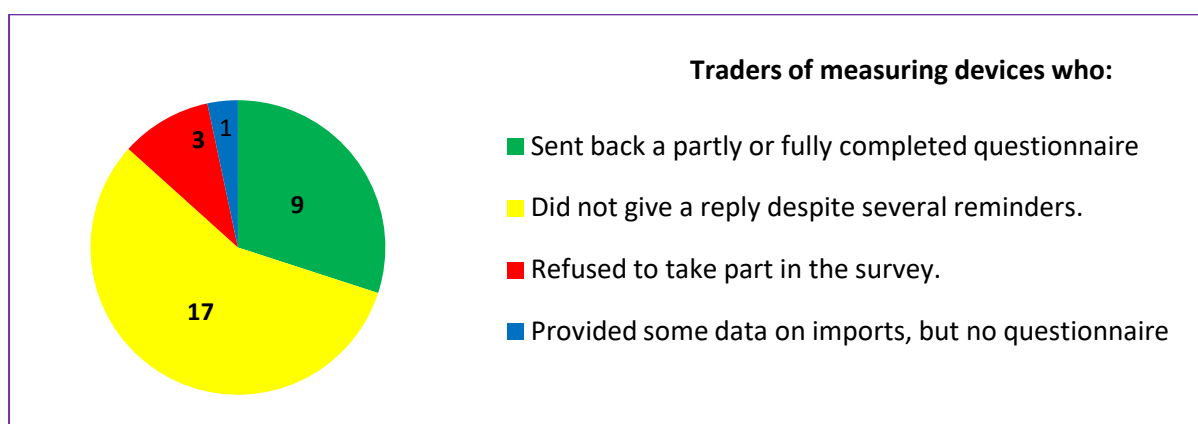
4.2 Findings on measuring devices

According to Annex A of the Minamata Convention, the following non-electronic mercury-added devices are to be phased out by 2020, except in cases where no substitutes are available:

- Barometers
- Hygrometers
- Manometers
- Thermometers
- Sphygmomanometers

Substantial time and resources were devoted to conducting the surveys on measuring devices. Among the above listed measuring devices, it was easier to identify traders for thermometers and sphygmomanometers than for the other products or devices. The low level of response (as mentioned in Chapter 3) is summarized in Figure 6 below.

Figure 6: Survey participation status of traders



In a few retail shops, mercury-added thermometers and sphygmomanometers were on display. However, these traders neither wished to take part in the survey nor give any indication as to how many of those devices were sold, etc. In addition, mercury-added medical (fever) thermometers were found on sale in retail pharmacies as of December 2017. These are easily purchased at less than USD 2 per instrument.

During field visits, very few traders of other measuring devices (listed above) could be identified. In addition, companies like industrial gas providers or water engineering companies use such equipment for highly specific applications and import these devices directly.

4.2.1 Feedback from traders

There were only nine traders who responded to the survey (i.e., with either a partly or a fully completed questionnaire) whilst one trader provided only approximate numbers of devices imported in 2016. According to the responses, seven of these nine traders were importers of these devices. The remaining two respondents were wholesalers/retailers who purchased devices from importers and then sold them mostly to local users such as private clinics, doctors, etc.

One of the seven importers did not specify which type of devices it imports, while the other six supplied a variety of measuring devices, including for the veterinary sector. These traders were large companies established for many years, which also import various other laboratory products like testing equipment, glassware, consumables and reagents. Moreover, respondents for medical sphygmomanometers, blood pressure monitors and medical thermometers also were typically large companies importing various pharmaceuticals and medical equipment.

Although very few of the respondents identified their customers, these traders have distribution networks across the country. As some large companies did not send back a completed questionnaire or provide relevant information, the data obtained from the

survey should not be construed as 100% of the trade for all of Mauritius. Data gathered from traders of different types of devices are summarized in the table below:

Table 15: Measuring devices traded as per survey

	Stakeholder type	Category of devices	No. of respondents
1	Importer	Mercury-added laboratory thermometer	1
2	Importer	Mercury-free laboratory thermometer	2
3	Importer	Mercury-added medical thermometer	2
4	Importer	Mercury-free medical thermometer	3
5	Importer	Mercury-added sphygmomanometer	1
6	Importer	Mercury-free sphygmomanometer/BP monitor	4
7	Wholesaler	Mercury-free sphygmomanometer	2

The survey questionnaire requested data on the devices imported into Mauritius as from 2013 onwards. Responses gathered from importers showed that measuring devices of both types (i.e., mercury-added and mercury-free) have been imported from 2013 to 2016. However as new companies tend to start up periodically, one such trading company provided data for 2016 only, as it started to import measuring devices a year back. Not all respondents specified the number of customers to whom devices have been supplied. Moreover, the respondents may have taken into account previous stocks (i.e., purchased prior to 2013) since the number of customers supplied with devices exceeded the actual number of devices imported in a few cases.

In general, these measuring devices were imported from various countries, but mainly from China. The devices are also compliant with European Union norms (CE), ISO Standards, etc., according to the respondents. Table 16 shows some of the data received.

Table 16: Data on devices imported by respondents (2013 – 2016)

Data gathered	Importers	No. of devices imported	Approx. cost (MUR)	Country / countries of origin	No. of customers supplied
Measuring devices Mercury-added laboratory thermometers	TMD/1	400	15 600	China	26
Mercury-free laboratory thermometers	• TMD/1 • TMD/7	• 500 • 150	• 17 500 • 11 500	• China • UK	• 51 • n/s
Mercury-added medical thermometers	TMD/24	450	74 250	India	n/s
Mercury-free medical thermometers	• TMD/4 • TMD/9 • TMD/24 • TMD/28	• 22 000 • 80 • 90 • 50	• n/s • 100 000 • 11 700 • n/s	• China • EU, US • China • n/s	• n/s • 75 • n/s • n/s
Mercury-added sphygmomanometers	TMD/3	50	75 460	UK	115
Mercury-free sphygmomanometers/ blood pressure monitors	• TMD/3 • TMD/4 • TMD/7 • TMD/28	• 293 • 25 • 50 • 100	• 402 180 • 100 000 • 11 000 • n/s	• UK • Germany • China • n/s	• 56 • 75 • n/s • n/s

n/s = not specified

The above figures are based on feedback from the responding importers only. The number of devices imported would automatically take into account those sold by wholesalers and retailers. Accordingly, figures from the latter stakeholders were not considered so as to avoid double-counting. In addition to the figures, the respondents have not specified any specific challenges which they encountered for the trade of these devices except for import permits for mercury-added thermometers, according to one of the importers. From their feedback, some of the traders indicated that they also provided after-sales service, without specifying for which measuring devices. These services included:

- Advice/demonstration on use
- Request for technical assistance from the original supplier/manufacturer
- Training of end-users
- Calibration of devices
- Take-back of faulty or broken devices
- Changing of spare parts

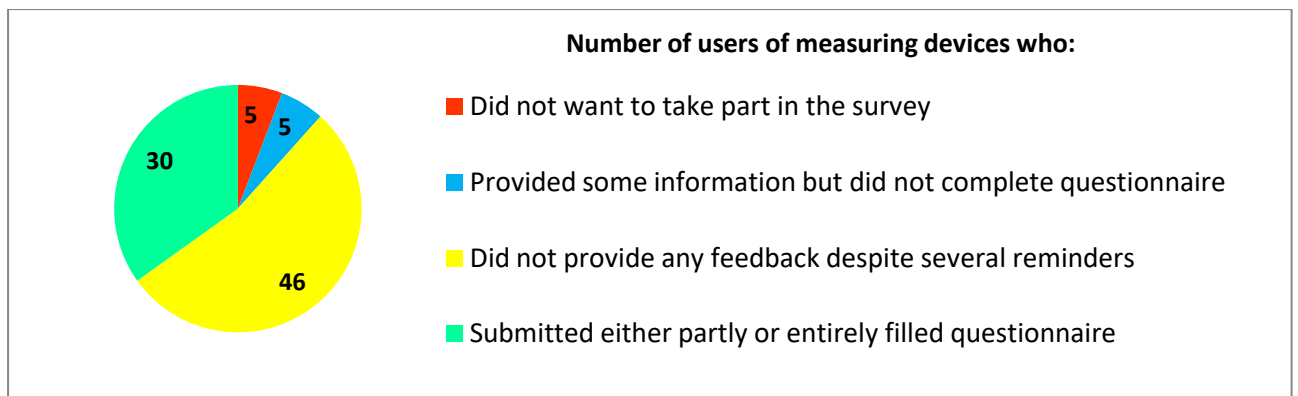
With regard to mercury-free measuring devices, some specific types are already being imported and distributed, based on customer orders (e.g., tympanic/temporal infrared medical thermometers have been supplied to customers like private hospitals and clinics.) However, a strong shift to mercury-free measuring devices has not been noted so far, as there has not been significant customer demand. As reported in the questionnaires

received, the time required to fill orders for mercury-free devices is usually from two weeks to two months. A number of the responses of the traders suggested a lack of awareness on the requirements of the Convention.

4.2.2 Feedback from users

With regard to the users of measuring devices, the survey participation status is presented in Figure7 below:

Figure 7: Survey participation of users

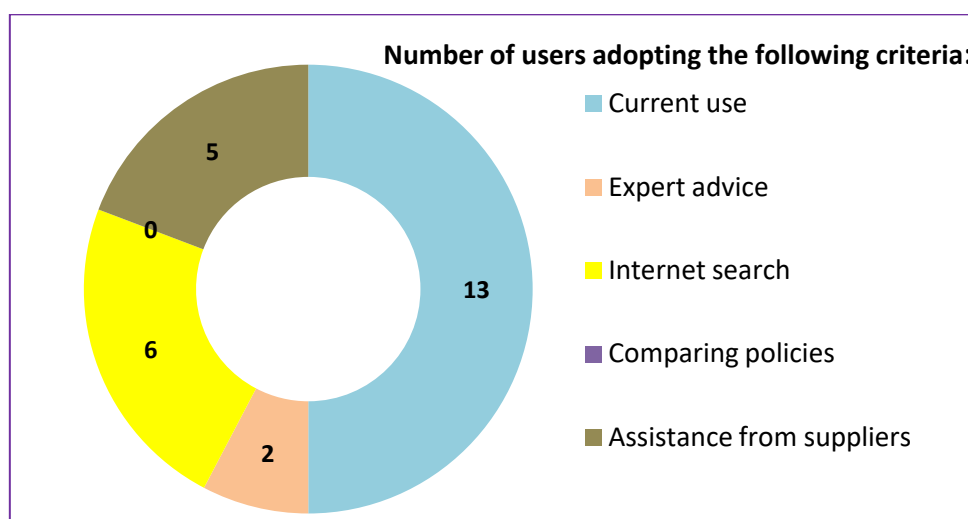


As mentioned above, the survey of users focused on institutions rather than individual users such as private medical practitioners operating at their own facilities. Thirty (30) survey questionnaires were received from the various institutions encompassing the public, private, academic and research sectors.

One preliminary finding of the survey is that both mercury-added and mercury-free measuring devices are in use within these institutions. End-users include staff, trainees and students, who may require some basic training from more experienced staff or via guidance from instruction manuals, depending on the device. In most institutions, technical specifications of new measuring devices are subject to approval before procurement is initiated.

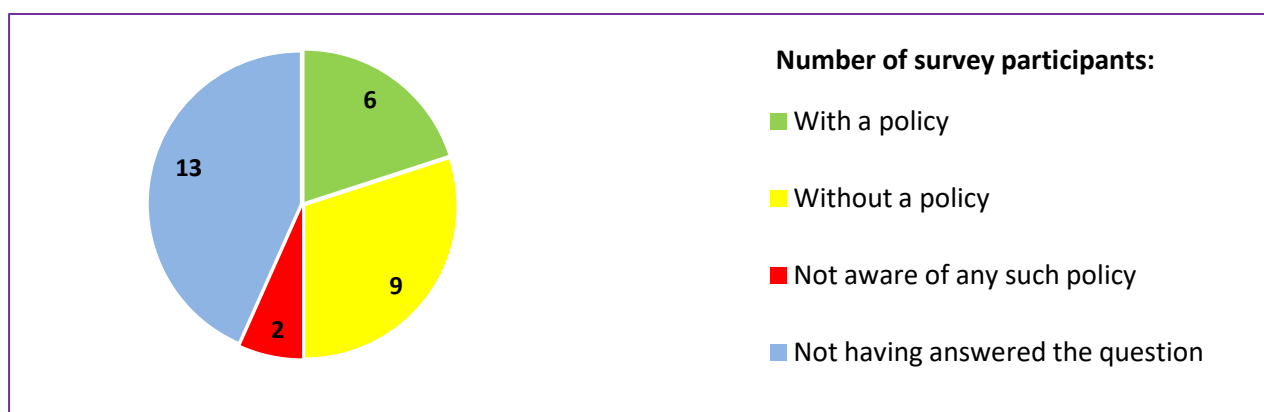
Figure 8 shows the typical criteria for this approval as expressed by 26 respondents, where multiple criteria from the same stakeholders were included.

Figure 8: Selection of new measuring devices by respondents



With regard to procurement policy encouraging a shift towards mercury-free measuring devices, this is typically dependent on management decisions or official recommendations at institutional level. Figure 9 summarizes the replies of the survey respondents with regard to procurement policies for the use of mercury-free measuring devices in their respective organizations.

Figure 9: Existence of policy on mercury-free measuring devices



As per feedback obtained through the survey, in some of the institutions measuring devices purchased before 2013 are still in use and no new ones have been procured. Moreover, some of the users contacted did not respond to the questionnaire but simply reported on the numbers and types of measuring devices they possess.

Table 17 presents some information from respondents on mercury-free measuring devices purchased from 2013-2015.

Table 17: Mercury-free measuring devices purchased by respondents

Mercury-Free Laboratory Thermometer						
User's code	User type	No. of units	Amount (MUR)	Country of origin	Product Type	Compliance/specification
UMD/PS/7	Private hospital	2	n/s	China	Alcohol	n/s
UMD/PS/39	Private manufacturing company	12	2 200	UK	Alcohol	n/s
UMD/GS/14	Parastatal laboratory	• 5 • 1 • 1	• 12 000 • 3 085 • 19 800	• USA • England • China	• Alcohol • Digital • Infra Red	• ANSI • NIST • BS
Mercury-Free Medical Thermometer						
User's code	User type	No. of units	Amount (MUR)	Country of origin	Product Type	Compliance/specification
UMD/PS/7	Private hospital	75	5 000	China	Digital	n/s
UMD/PS/11	Private hospital	10 202	1 340 788	Switzerland	Digital	CE
UMD/PS/15	Private hospital	9 898	1 346 128	n/s	Digital	n/s
Mercury-Free Sphygmomanometer						
User's code	User type	No. of units	Amount (MUR)	Country of origin	Product Type	Compliance/specification
UMD/PS/7	Private hospital	15	30 000	• Germany • China	• n/s • n/s	• n/s • n/s
UMD/PS/11	Private hospital	• 6 • 3	• 18 885 • 12 651	• n/s • UK	• Manual • Wall-type	• CE • n/s
UMD/PS/15	Private hospital	• 30 • 30 • 40	• n/s • n/s • n/s	• Netherlands • Germany • Netherlands	• Pocket • Aneroid • Monitor	• n/s • n/s • n/s

n/s = not specified

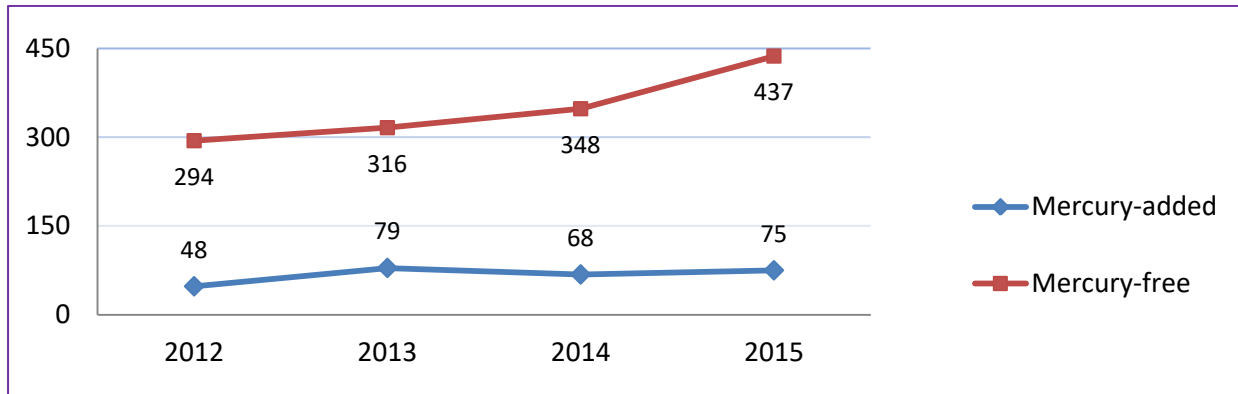
4.2.3 Equipment performance

One key aspect of the performance of measuring devices (e.g., thermometers) is their calibration. Thermometer calibration is usually conducted using a reference standard by an external organization or a service provider. In Mauritius, such calibration is conducted by the Metrology unit of the Mauritius Standards Bureau (MSB), which falls under the MoICCP. The MSB¹⁷ undertakes calibration of various types of thermometers (mercury-column, alcohol, bimetallic, etc.) and other temperature measuring equipment (ovens, thermocouples, etc.). These services are invoiced and are usually completed within three days of any request. The MSB issues the requesting organization a calibration certificate which remains valid for one year.

¹⁷The MSB is a member of the International Organisation for Standardisation (ISO). In conjunction with its Metrology Unit, it houses a Standards Development Unit and other technical units that provide testing and assessment facilities.

The following figure shows the trend from 2012 to 2015 in the number of mercury-added and mercury-free thermometers calibrated by the MSB.

Figure 10: Trends in thermometers calibrated by the MSB



Source: MSB

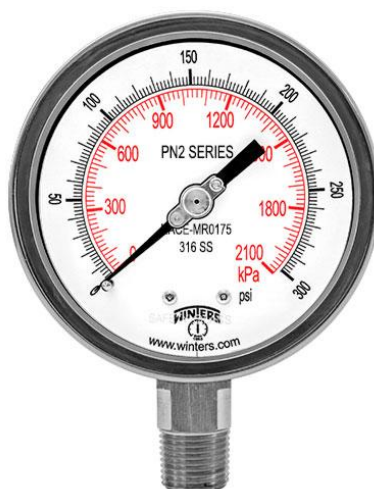
From the above figure, the average ratio of mercury-free thermometers to mercury-added thermometers calibrated is approximately 6:1. Importantly, a significant increase in the number of calibrated mercury-free thermometers is noted from 2012 to 2015.

Mercury-free (i.e., electronic) measuring devices such as data loggers are calibrated outside Mauritius. Based on the Mauritian Government's policy encouraging laboratories to become accredited to the ISO/IEC 17025 Standard (for testing and calibration laboratories) and to the ISO 1589 Standard (for medical laboratories), it is expected that calibration services will expand in the future. As of 31 December 2017, the number of laboratories accredited to the ISO/IEC 17025 Standard by MAURITAS, (Mauritius Accreditation Service), the national accreditation body in Mauritius, part of the National Quality Infrastructure was about 30 (a few had a pending accreditation status).

With regards to sphygmomanometers, calibration is not currently available in Mauritius. However, mercury-free versions of these devices, which are locally available, are in compliance with the World Health Organization (WHO) guidelines as well those of the European Society of Hypertension (ESH) and the British and Irish Hypertension Society (BIHS), which are internationally accepted standards.

Little data on equipment performance of the other listed measuring devices has been obtained during the study. For instance, the Mauritius Meteorological Services (MMS) may also provide verification services of weather-monitoring devices including barometers and one private company which undertakes maintenance of maritime navigation instruments on ships. The following picture shows a measuring device that can be purchased from a local importer for pressure measurements.

Picture 3: Mercury-free manometer gauge.



Source: Local Importer

4.2.4 Analysis

Measuring devices listed in Annex A of the Minamata Convention are either imported through local suppliers or obtained via donations. Mercury-free measuring devices are already in use despite generally being more expensive than the mercury-added devices used for the same function. In the case of electronic thermometers, some of these devices also have the capability to measure other parameters like pH, conductivity or relative humidity; such multi-functionality represents an advantage to users. Various other electrical and electronic equipment (e.g., ovens, furnaces, water baths, autoclaves) are equipped with temperature sensors, which are also expected to be mercury-free by 2020 under the terms of the Convention.

The extent of the shift towards mercury-free devices could not be confirmed for all sectors and institutions. The following sections further discuss the use of relevant devices by sector.

4.2.4.1 Weather-monitoring The MMS currently uses thermometers, barometric and related equipment rain gauges (not listed in Annex A of the Convention) that contain a small amount of mercury. The MMS does intend to a complete shift to mercury-free devices pending to the availability of viable alternatives especially in terms of accuracy and adaptation to the local climatic conditions¹⁸. It could be gathered from discussions with its representatives that only their barometers are mercury-free as of date.

4.2.4.2 Food and beverage sector

¹⁸With a prevailing tropical climate, Mauritius is prone to low pressure systems or cyclones and heavy rainfalls. As such, weather monitoring is essential for smooth operations of various sectors like agriculture and fishing

One sector which has already been phasing out mercury-added devices is the food industry. For the past 30 years or so, the use of mercury-free 'cooking thermometers' has prevailed in food-related businesses (restaurants, food-manufacturing industries, hotel and culinary training institutions). Communications with a few traders confirmed the import and distribution of mercury-free meat and cooking thermometers.

The picture below shows (i) dairy and (ii) meat mercury-free thermometers currently available on the market in Mauritius.

Picture 4: Mercury-free thermometers for the food sector



Source: Importer of equipment for food-related industries.

Relevant sections of the Food Act 1999 discourage the use of mercury-added devices. For instance, Section 36 stipulates that any equipment used in the preparation or production of food shall be constructed or maintained so as not to constitute a hazard to the health of consumers.

4.2.4.3 Academic sector

As of 31 December 2017, there were about 200 academic institutions providing secondary level education in Mauritius. Some of these institutions are equipped with science laboratories for Biology, Chemistry and Physics classes and typically use mercury-added devices (mostly thermometers). For the governmental colleges, the MoEHRTESR is responsible for the procurement and supply of these devices. .. The private secondary institutions which outnumber the public institutions receive grants from the Private Secondary Education Authority (PSEA) to purchase their own devices; however, no information was obtained from this regulatory institution.

However, it was found that the institutions still use mercury-added thermometers for instance, the Mahatma Gandhi Institute (MGI) which officially submitted figures on the number of these devices as available in the six institutions under its purview in 2016. Institutions may sometimes purchase these devices directly from suppliers using their own

funds, for instance via Parent Teacher Association (PTA) contributions. The number of mercury-added thermometers found in use and in stock at the secondary level may range from 50 to 300 per institution, depending on class size and subjects taught. The institutions also store unserviceable (faulty, broken, etc.) thermometers. For private laboratories within the academic sector, reagents and associated equipment are often purchased by individual teachers or coaching classes. There is little regulatory control by official institutions within the academic sector for such purchases.

During the study it was found that there was no procurement policy for mercury-free measuring devices at the secondary level institutions offering science courses at Higher School Certificate (HSC) level. Furthermore, the choice of devices may not only rest with the academic institutions or their higher authorities, since most examinations at the end of secondary education (HSC level) are jointly organized by the University of Cambridge International Examinations (UCIE) and the Mauritius Examinations Syndicate (MES).¹⁹

At the tertiary level, the use of mercury-added measuring devices has declined, as is evident from the mercury-free alternatives at the University of Mauritius (UoM). However, for some special applications that require measuring temperatures above 300°C or overnight temperature monitoring, mercury-added thermometers are still used.

At another tertiary level institution that operates a local branch in Mauritius, it was found that their devices were supplied directly by the parent university, and all of them are mercury-added. Replacement or procurement of new measuring devices takes place in the country where the parent university is based. However, no further information was gathered from the local campus, such as the frequency of replacement of the devices, challenges related to transportation or customs clearance, etc. At the time of the interviews, there was apparently no policy for using mercury-free thermometers at this institution.

Along with a shift to mercury-free measuring devices in the academic sector, associated services like maintenance or calibration would still be required. Accordingly, the assistance of institutions like the MSB, which has been mentioned previously, and the Tertiary Education Commission (TEC) may be sought. The Centre for Instrumentation Services (CIS) is a technical department under the TEC and is currently housed on the premises of the UoM campus in Réduit. CIS undertakes repairs and maintenance of laboratory equipment such as pH meters, electronic balances, spectrometers, etc., for the UoM (mainly) and a few other government institutions.

Technical courses under the Mauritius Institute of Training and Development (MITD) or the newly created Polytechnics Mauritius Ltd. could also include modules aimed at management and repair of mercury-free electronic devices. These may not be limited to the academic

¹⁹Even before the creation of the MES in 1984, national examinations at HSC level were being organized in partnership with UK Universities, as Mauritius was a former British colony.

sector, but may be extended, for instance, to the Mauritius Institute of Health, which already runs training courses for health-care professionals in Mauritius.

4.2.4.4 Healthcare sector

In the healthcare sector a complete shift to mercury-free measuring devices has not been achieved thus far. As presented in Table 17 above, about 2.7 million MUR were spent for the import of mercury-free measuring devices for the period 2013-2015 by the survey respondents. User institutions (e.g., private hospitals, clinics, and medical laboratories) appear to have a general preference for using mercury-free devices, whilst one of them is even accredited to the Joint Commission International (JCI),²⁰ which requires the accredited institution to establish a proper program for the handling, storage and use of hazardous materials; as a result, according to its response, it no longer uses mercury devices.

With regard to government healthcare facilities, a shift has apparently taken place, as confirmed by the MoHQL's representatives during official meetings and workshops during the study. This is also confirmed in the draft MIA report (draft 9.11.2017, see p. 85 - Medical blood pressure gauges (mercury sphygmomanometers)). In its bidding document for the procurement of medical equipment, dated May 2017, the MoHQL requested mercury-free sphygmomanometers from prospective suppliers. Moreover, in one of the five national hospitals in Mauritius, is found a special ward dedicated to hyperbaric medicine which houses specialised medical equipment working at controlled pressure.

Besides the Ministry, the Medical and Dental Council of Mauritius and the Nursing Association of Mauritius were also contacted for relevant information on the import and use of measuring devices in the public healthcare sector, but no response was received.

Besides the scientific, technical and economic rationales for the shift towards mercury-free devices, there are some psycho-social aspects that should be addressed. Often these are not easily recognized as they tend to emerge at the human level. For instance, it has been observed that medical professionals who have used the traditional mercury-added sphygmomanometer for many years are reluctant to use an alternative device. To help deal with this challenge, it is expected that suppliers of mercury-free devices can be of assistance (e.g., by holding product seminars for medical professionals, informing them of the efficacy, reliability, accuracy and performance of mercury-free devices, arranging hands-on demonstrations, etc.).

The picture below shows a locally available mercury-free sphygmomanometer.

²⁰The JCI accreditation has been granted to healthcare institutions in more than 100 countries for best practices.

Picture 5: Mercury-free sphygmomanometer



4.2.5 Conclusions on measuring devices

Based upon the data collected for this study, the following conclusions are noted:

- Medical devices (fever thermometers, sphygmomanometers) are the highest volume mercury-added products within this product category, and all of the devices are imported;
- Mercury free fever thermometers and sphygmomanometers are widely available in Mauritius, and are imported in significant quantities;
- The transition to mercury-free medical devices in the private health care institutions is well underway, and can be fully achieved by 2020;
- It appears that the 2020 phase-out date for measuring devices can be achieved for the public sector as well;
- More information is needed with regard to the transition to mercury-free measuring devices for the academic sector, given that mercury-added devices are still purchased and used in spite of the availability of affordable mercury-free alternatives. Awareness raising activities would probably be helpful;
- For the measuring devices for which little data could be gathered during this study, namely barometers, hygrometers and manometers, additional investigations are needed in order to determine the extent of the transition to mercury-free devices;
- The existence of basic support services for mercury-free measuring devices, such as calibration and maintenance services, would increase users' confidence in the quality and efficacy of these devices to the detriment of the mercury-added ones.

4.3 Findings on batteries

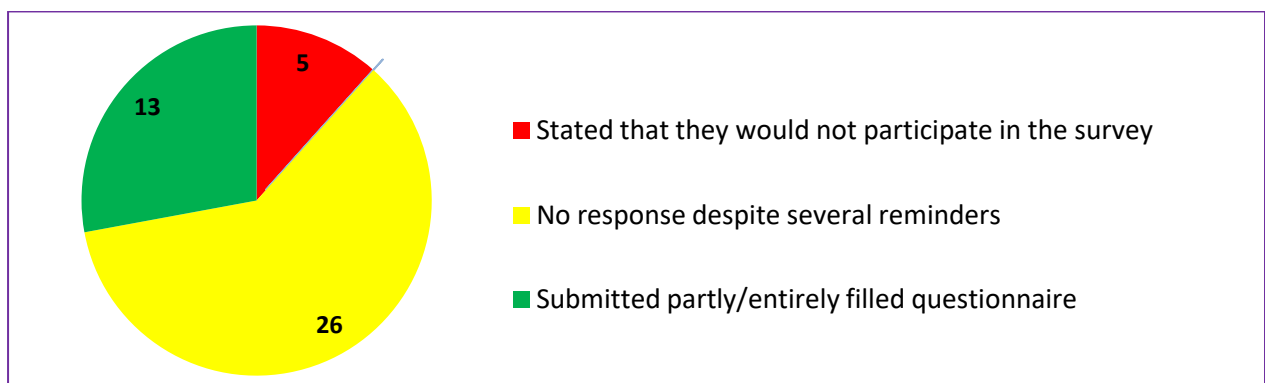
Different brands of batteries, including both pencil/cylindrical types (e.g., AA or AAA) and button cells are presently imported by various trading companies. When they need to be

replaced, these batteries are purchased from small watch repair companies, retail shops and supermarkets. In some informal cases, hawkers also sell batteries especially within market areas, including some lesser known brands which may have circumvented customs or other regulatory controls. Brands of duplicate or counterfeit batteries tend to be sold at cheaper prices.

Although mercury-added batteries are listed as prohibited goods (CPA, 1999), surveys of both traders and distributors were conducted. These ranged from small watch-repair shops locally known as ‘Horlogeries’ to large distributors of devices (e.g., calculators, mobile phones, toys, etc.) in which batteries are used. Some of these devices have a high import value: clocks and watches imported in 2015 amounted to MUR 690 million (SM). Some companies (e.g., supermarket chains or large watch companies) may also import batteries to meet seasonal retailing demands such as during festive seasons or cyclonic periods in Mauritius.

Figure 11 shows the level of survey participation by 44 user/distributor stakeholders, representing a 29.5% response rate.

Figure11: Survey participation status for users / distributors of batteries



4.3.1 Feedback from importers

As only two trading companies involved in imports of batteries returned partially completed surveys, the responses may not provide an accurate determination for Mauritius. However, both respondent companies are importers of famous international brands, and the first (TB/1) is one of the largest importers of button cells and cylindrical cells. The data shown in the table below, together with the following bullet points, summarize the responses received from the two importing companies.

Table 18: Batteries imported by respondents

Types of batteries imported & specifications		TB/1	TB/2
Convention non-compliant	Mercuric oxide (all kinds)	No	No
	Zinc–air button cells ≥ 2% mercury, e.g., for hearing aids	No	No
	Mercury-added alkaline-manganese button cells or primary cells	No	No
	Mercury-added zinc-carbon cylindrical cells	No	No
Convention-compliant	Silver oxide button cells with < 2% mercury, e.g., for watches	Yes	Yes
	Zinc–air button cells with < 2% mercury, e.g., for hearing aids	Yes	No
	Mercury-free alkaline-manganese button cells or primary cells	Yes	Yes
	Mercury-free zinc-carbon cylindrical cells	Yes	No
	Lithium primary batteries or cells	Yes	Yes
Number of batteries imported		TB/1	TB/2
All types	Imported in 2013	1 637 740	--
	Imported in 2014	1 870 047	206 404
	Imported in 2015	2 268 836	286 734
	Total	5 776 623	493 198

- The trader TB/1 has a larger market share as it is the official representative of more than one brand of battery imported into Mauritius.
- No mercury-added batteries appear to be imported by these two survey respondents.
- The main countries of origin for imported batteries are Malaysia, Indonesia, Japan, China, Germany, Poland, UK and USA.
- It usually takes less than one month to fill an order for batteries, and there appears to be no particular challenge to importing Convention-compliant batteries.
- Certificates of chemical composition for batteries are usually not requested from the traders.
- So far, there are no specific customer requests for Convention-compliant batteries, but both companies would be able to provide them by 2020.

4.3.2 Feedback from users/distributors

Some user/distributor companies import replacement batteries needed for devices such as calculators, toys, watches, hearing aids, etc., sold and distributed by them. These companies may also be involved in retail sales of other batteries. In some cases, imported devices already have pre-installed batteries from the country of origin (i.e. luxury watches and clocks.) The following points were also gathered from the questionnaires:

- The criteria for battery selection are variable; some are based on expert advice or assistance from suppliers of batteries.
- The amount of time for importing batteries varies according to the specifications.

- The users/distributors currently have no policy for the procurement of Convention-compliant batteries.
- Being unaware of the requirements of the Convention, most respondents did not know if they would be able to ensure Convention-compliant batteries by 2020.
- Most did not make comparisons between Convention-compliant and Convention non-compliant batteries for requested criteria (e.g., shelf-life, availability or affordability.)
- Certificates on the chemical composition of batteries are generally not requested from the importers and wholesalers.

Only eight of the twelve respondents to the survey provided some quantitative information on the numbers and types of batteries purchased and sold/distributed by them for the period 2013 to 2015. These stakeholders represented various categories ranging from well-known companies selling luxury or designer items, to small businesses involved in the sale and distribution of batteries. The following table shows the data from survey responses.

Table 19: Survey data from battery users / distributors

User/distributor		Year	Approximate battery units			Country of origin	Type of batteries
Code	Category		Purchased	Cost price (MUR)	Sold / distributed		
WCDR/B/2	Importer and brand distributor of watches and clocks	<ul style="list-style-type: none"> • 2013 • 2014 • 2015 	<ul style="list-style-type: none"> • 4 000 • 4 250 • 9 000 	<ul style="list-style-type: none"> • 40 575 • 59 495 • 141 250 	<ul style="list-style-type: none"> • 3 500 • 4 000 • 7 000 	Japan	Hg-free lithium manganese dioxide batteries
WCDR/B/3	Large importer of watches, clocks and other luxury items for sale at various outlets	<ul style="list-style-type: none"> • 2013 • 2014 • 2015 	<ul style="list-style-type: none"> • 25 • 25 • 25 	<ul style="list-style-type: none"> • 1 875 • 2 500 • 3 125 	n/s	Japan	Hg-free alkaline Button cells
WCDR/B/5		<ul style="list-style-type: none"> • 2013 • 2014 • 2015 	<ul style="list-style-type: none"> • 1 390 • 1 790 • 1 785 	<ul style="list-style-type: none"> • 62 000 • 36 400 • 41 200 	<ul style="list-style-type: none"> • 1 139 • 1 409 • 1 563 	<ul style="list-style-type: none"> • Germany • USA • USA 	<ul style="list-style-type: none"> • Hg-added • Hg-free • Hg-free (AgO button cells)
WCSR/B/3	Small business involved in one or more of the following:	<ul style="list-style-type: none"> • 2013 • 2014 • 2015 	<ul style="list-style-type: none"> • 2 000 • 2 500 • 3 500 	n/s	n/s	Japan	Button cells for hearing aids or other types
WCSR/B/4	<ul style="list-style-type: none"> • Sale of button cells on retail basis • Replacement of old button cells in watches, calculators, remote controls, etc. • Repair of clocks 	<ul style="list-style-type: none"> • 2013 • 2014 • 2015 	<ul style="list-style-type: none"> • 4 000 • 3 500 • 4 500 	<ul style="list-style-type: none"> • 100 000 • 87 500 • 126 000 	<ul style="list-style-type: none"> • 3 000 • 3 500 • 5 000 	Japan & Singapore	Hg-free alkaline manganese and other button cells
WCSR/B/5		<ul style="list-style-type: none"> • 2013 • 2014 • 2015 	<ul style="list-style-type: none"> • 1 200 • 1 200 • 1 100 	n/f	n/s	China	Hg-free alkaline manganese and other button cells

User/distributor		Year	Approximate battery units			Country of origin	Type of batteries
Code	Category		Purchased	Cost price (MUR)	Sold / distributed		
	and watches						
VAGR/B/1	Retailer of various items including batteries	<ul style="list-style-type: none"> • 2014 • 2015 	<ul style="list-style-type: none"> • 1 200 • 1 200 	<ul style="list-style-type: none"> • 6 000 • 6 000 	n/s	<ul style="list-style-type: none"> • Indonesia • Poland 	Hg-free alkaline manganese button cells
VAER/B/4	Importer and distributor of electronic items	<ul style="list-style-type: none"> • 2013 • 2014 • 2015 	<ul style="list-style-type: none"> • 10 • 15 • 30 	n/f	n/s	China	Hg-free alkaline manganese button cells
Total			48 245	713 920	30 111	--	--

Key: n/s =not specified ; n/f = not fixed

4.3.3 Analysis

The fact that mercuric oxide batteries are imported into Mauritius as indicated in CD data appears to violate the CPA. Moreover, it is not clear whether the level of mercury in zinc silver oxide batteries and zinc air button cells complies with the Convention limit of < 2% mercury.

Unlike for pharmaceutical products or pesticides, there is no multi-stakeholder mechanism for regulatory control of the import of batteries. Some situations also exist whereby batteries may not be subject to rigorous Customs controls (for instance, if a person enters the country with a product purchased outside of Mauritius with batteries pre-installed, or if someone receives the product by courier or e-commerce). Moreover, batteries and their packaging do not always mention mercury content, and in many cases the inscriptions are not easily legible due to the small size of the print. This poses a challenge to regulators, both during customs controls and to consumers at the time purchase.

The lack of testing capacity in Mauritius implies that controls are based only on accompanying documents for the imported batteries, which represents a further challenge for regulatory authorities. Counterfeit batteries also reach the market via informal channels, with no accompanying documents. In the survey responses, many of the respondents asserted that mercury-free certificates are usually not requested for button cells or pencil type batteries. On the other hand, it was noted that vehicle battery importers are required to furnish a mercury-free certificate despite the fact that such batteries are lead-acid accumulators and typically contain no mercury.

4.3.4 Conclusions

From 2010 to 2016, Mauritius imported about 500 million batteries with an estimated value of 1 607 million MUR (CD). Due to lack of complete data, it is unclear what percentage of these batteries may contain mercury, although mercury-added batteries are considered as

prohibited goods according to the CPA. No significant challenges were mentioned in meeting the target of 2020 for Convention-compliant batteries.

4.4 Findings on lamps

In Mauritius there are no import restrictions for lamps except incandescent lamps ≥ 75 watts, laser penlights and torches of at least 1 megawatt, which are prohibited under the CPA. In addition, there are no restrictions on sales of lamps, which can be purchased from importers, wholesalers, retailers, supermarkets, shops specialized in hardware and electrical products locally known as '*quincailleries*', etc. Large users such as local authorities usually invite bids from traders (for instance during the procurement of street lamps).

A few shops were found exclusively selling lamps, luminaires and lighting accessories for domestic, office or small applications. Moreover, companies and Small and Medium Size Enterprises (SMEs) sometimes provide custom-made lighting products. Lamps are also used in advertising panels, sign boards or display screens. In these cases, lamps may either be directly imported by stakeholders or purchased from local companies.

It was anticipated that importers of lamps could provide information on the mercury content due to their connections with original distributors, manufacturers or other sources in the supply chain. Unfortunately, the limited information provided did not confirm this expectation.

4.4.1 Feedback from importers

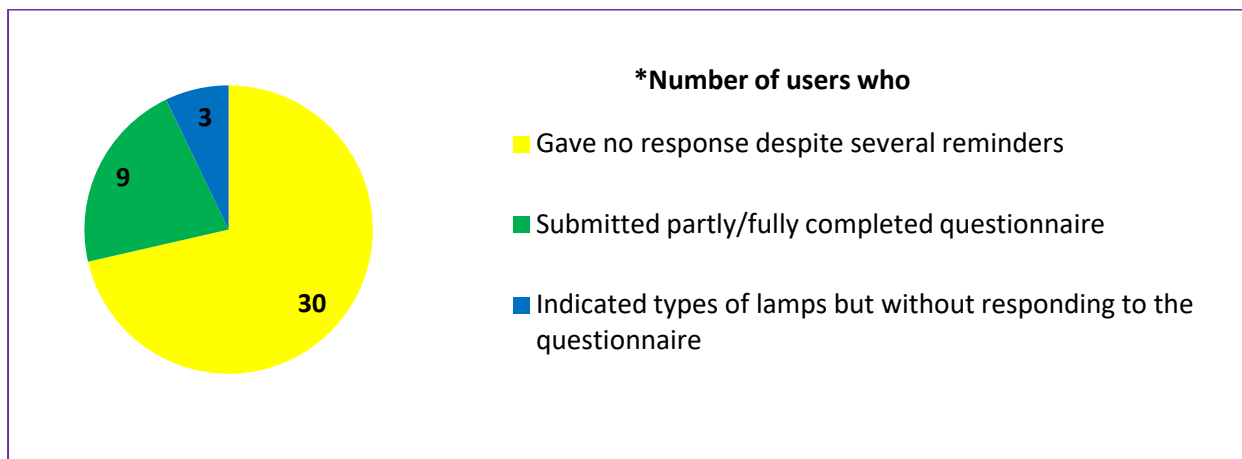
Despite various attempts to obtain data from traders, only two responded to the survey. Both are large importers and distributors of lamps and other electrical products to smaller trading companies, hardware shops and supermarkets. However, quantitative information (for instance, the number of lamps imported per year) was not provided by these importers. It was found that about a dozen brand representatives of lamps (large importing companies) currently operate in Mauritius, who take part in local tenders for the provision of lamps and associated products for localities or at national level.

Personal visits to importing companies failed to obtain information on the mercury content of lamps, and also showed that they were unaware of the Convention and its relevant requirements. At some of the importers' showrooms, technical specifications of lamps published in product catalogues were on display, and could be consulted by customers. In very few cases, mercury-added lamps were found on sale in hardware shops. Various brands of lamps are imported into Mauritius, though most are manufactured in China and are marked with symbols like 'BS' or 'CE'.

4.4.2 Feedback from users

Only a few responses were obtained from users of lamps, including local authorities, shopping malls and academic institutions. They constituted both public and private sector stakeholders, while the chosen service providers for the surveys were involved in different sectors such as building rental, public infrastructure, telecommunications, airport operations, agriculture, etc. The objective of the questionnaire was to learn more about the types of lamps used, the existence of any policy for using lamps compliant with the Convention, the criteria for selection of lamps, disposal facilities, etc. Figure 12 shows the response rate to this survey among 42 users.

Figure 12: Survey participation by users of lamps



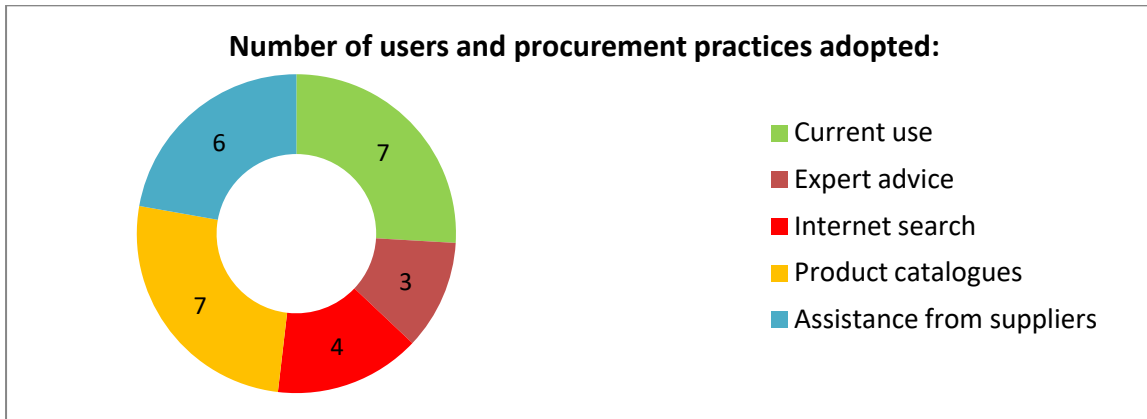
**excluding the CEB and the ESD.*

Further to the nine responses obtained, the following points were noted:

- All the respondents claimed to be unaware of the requirements of the Convention with regard to lamps;
- Most do not know the specifications of the lamps they use;
- A few confirmed that they used non-compliant lamps including high-pressure mercury vapor;
- None had a policy to procure only Convention-compliant lamps;
- None said they would not be able to use Convention-compliant lamps by 2020;
- There is no periodic frequency for the replacement of lamps used;
- In general there are no challenges for the procurement of the lamps used;
- Few of the users requested technical documents like compliance certificates from their traders; exceptions were local authorities and service providers. In one case, while the lamp specifications were shared, there was no mention of mercury content.

The selection process for new lamps was also variable. The following figure shows how the procurement decision is made, in which some respondents said they use several of these practices.

Figure 13: Procurement of new lamps by respondents



In general, the use of lamps has implications for stakeholders linked with the purchase, installation, maintenance or replacement of these products. In the context of Mauritius, the roles and responsibilities of these stakeholders are further described below.

❖ **Local authorities**

Mauritius²¹ comprises nine districts covering five urban localities (e.g., Port Louis, the capital city) and villages (rural areas). All urban and rural localities of Mauritius are administered on a regional basis by local authorities, namely the City Council (only for the capital), District Councils and Municipal Councils as stipulated by the Local Government Act. Among their various responsibilities, the local authorities provide lighting to buildings, motorways, streets, playgrounds, sports complexes or other facilities within their jurisdictions and geographical limitations. Thus, in terms of their size, the local authorities in Mauritius are the largest users of lamps. Moreover, some lamps are only used during major religious festivals. These authorities have their own departments for maintenance and other electrical works, including the installation and replacement of lamps. Nevertheless, not all of the lamp categories covered by the Convention are used by the local authorities.

The types and numbers of lamps used in the country are estimated due to the lack of accurate data for specific sectors. The case of street lamps provides a useful illustration. The distance between light posts differs from region to region (i.e., each kilometre of road does not have the same number of lamps). There also exist some public roads that do not have any lamps. Finally, the types of lamps used are influenced by various factors such as the type of road, prevailing climate, number of inhabitants in the region, etc. Therefore, for the whole of Mauritius, accurate and realistic figures are not available for the total number of lamps in use, not to mention their mercury content.

²¹ The Republic of Mauritius also comprises inhabited outer islands, namely Rodrigues and Agalega, which are smaller than the main island of Mauritius.

Table 20 provides a brief description of the regions of Mauritius and street lamp distribution.

Table 20: Distribution of street-lamp points in Mauritius

District Council (DC) / Municipal Council (MC)	ⁱ Size (km ²)	ⁱ Human population	ⁱⁱ Road network (km)	ⁱⁱ No. of street lamp points
Black River DC	259.0	80 939	448	6 936
Flacq DC	297.9	138 460	239	13 815
Grand Port DC	260.3	112 997	240	12 302
Moka DC	361.0	83 251	293	9 723
Pamplemousses DC	178.7	139 966	1 173	14 278
Plaines Wilhems :	196.2:	368 621:		
• BeauBassin-Rose Hill MC	(All the	• 104 610	• 295	• 12 814
• Curepipe MC	towns are	• 79 014	• 245	• 6 200
• QuatresBornes MC	less than	• 77 505	• 321	• 8 242
• Vacoas-Phoenix MC	100 km ²)	• 106 289	• 588	• 9 628
Port Louis CC	40.4	119 706	347	12 605
Rivière du Rempart DC	147.6	108 005	276	10 895
Rodrigues	104.0	42 058	n/a	n/a
Savanne DC	248.8	68 585	181	5 811
Total	1 978.5	1 262 588	4 547	123 249

Sources: *i* - Statistics Mauritius (figures published in Annual Digest of Statistics, 2015)

ii - Local Authorities (figures as of Feb. 2016, obtained from the MoEPU/CEB)

During the study, data were sought from local authorities on the numbers and types of lamps purchased and used, and other related information. Only three of the local authorities provided a completed questionnaire, while two merely asserted that they do not use any mercury lamps. Communications with staff of the lighting department at these authorities indicated a shift in favor of LED lamps. However, there was also a lack of knowledge of the mercury content of lamps in use, as well as of the Convention's requirements. Moreover, the authorities do not have any policy on types of lamps purchased and used, while detailed records such as inventories of the lamps were not available in some cases.

❖ Public places

Over the past two decades, several large commercial malls have flourished in Mauritius attracting thousands of visitors daily. These shops, supermarkets, food courts, parking areas and advertising spaces are also heavy users of lamps. Unfortunately, requests to obtain the types and numbers of lamps used, as well as other related data were unsuccessful, despite several attempts. The same situation occurred for the academic institutions contacted for the survey, some of which also run evening courses for which lighting is necessary. Another category of users to whom survey questionnaires were sent were sports facilities like football stadiums and gymnasiums, which use a variety of standard and specialty lamps, some of which may be covered by the Convention. In these cases as well, information could

not be easily obtained, though communications with some of their representatives indicated that metal halide lamps were commonly used in those settings.

❖ **Energy Services Division (ESD)**

The Energy Services Division (ESD) was contacted during the study. The ESD is a parastatal organization under the MoEPU, responsible for conducting various types of electrical works, including lamp installation and replacement in government-owned administrative buildings, educational institutions, football stadiums or other sports complexes, etc. According to the ESD, the most common lamps are CFLs of < 20 watts, LFLs of < 40 watts (types covered by the Convention) and LED lamps. Apparently, no consideration is currently given to the mercury content of lamps being installed or replaced.

❖ **Central Electricity Board (CEB)**

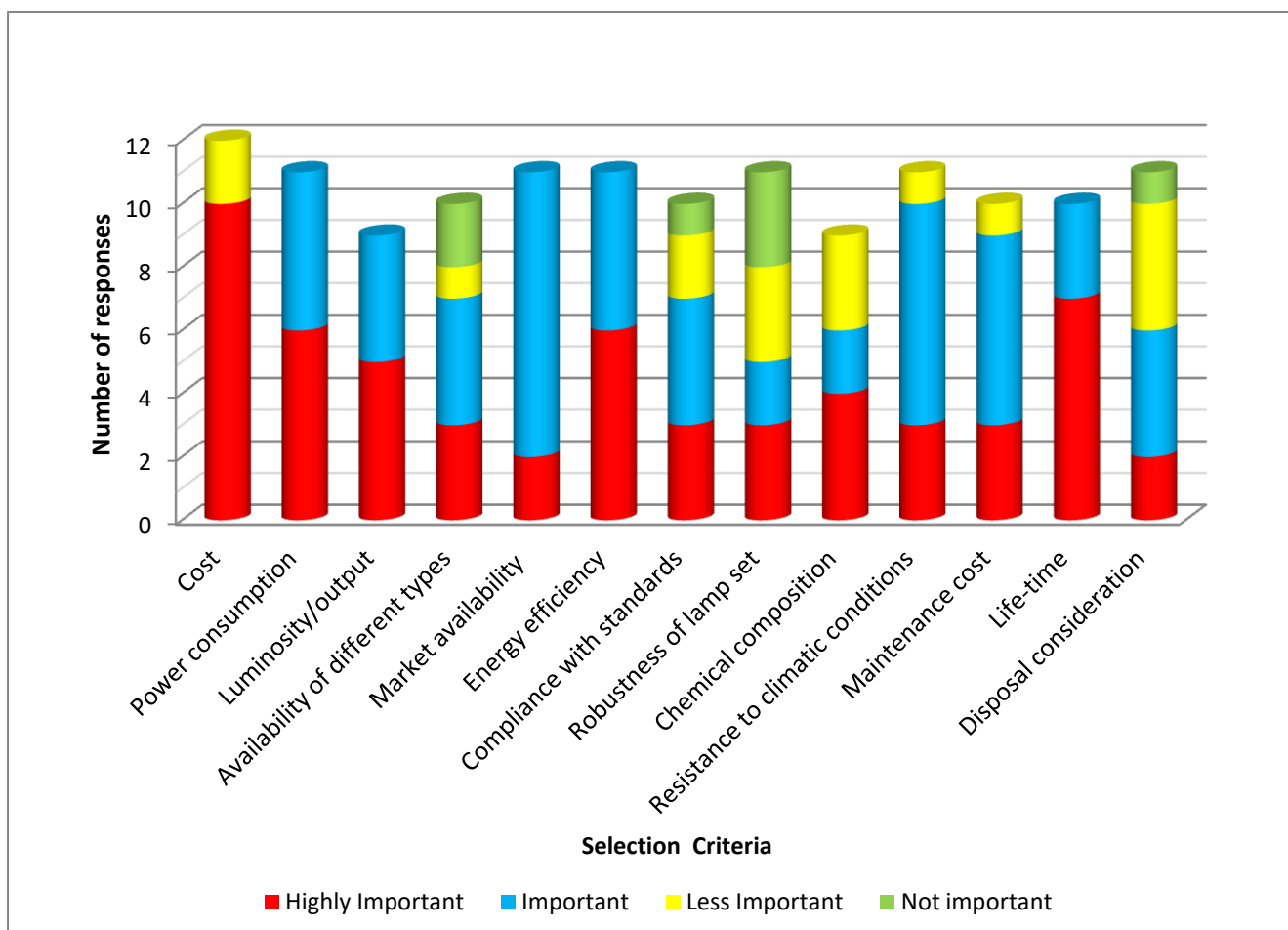
The Central Electricity Board (CEB), a parastatal organization under the MoEPU, is *inter alia* mandated to distribute and sell electricity in Mauritius. It has also been given responsibility for lamps and lighting systems. For instance in 2009, a scheme was launched encouraging families to exchange incandescent bulbs for fluorescent lamps sold by the CEB at a discount. In mid-2016, further to governmental decisions, the CEB was asked to improve and maintain the lighting on motorways M1, M2 and M3, which extend from north to south of the island, and it has been involved in the purchase and installation of lamps on these highways. For this purpose, 1800 street lamps were purchased since 2016, together with 250 additional high pressure sodium vapor lamps in 2017, via a local tendering process. Although sodium vapor lamps are not covered by the Convention, no information could be obtained from the CEB on the mercury content of these lamps, and apparently no policy decision concerning the use of mercury-free or Convention-compliant lamps has been taken by the CEB.

4.4.2.1 Selection criteria

Selection of lamps is normally based on criteria fixed by the users, contractors, etc. This selection may be done by the end-users themselves, through tender evaluations or other procurement practices. Through their respective questionnaires, stakeholders were queried on the importance given to these criteria for lamp selection. From eleven filled or partly filled questionnaires, it was seen that the cost of lamps remained one of the most important criteria with 90% of the respondents indicating it as a priority. This was further confirmed during communications with the stakeholders, especially the service providers. The mercury content of the lamps was not an important criterion based on the responses received.

Figure 14 shows the level of importance of these selection criteria according to the survey responses, although it should be noted that the number of responses was not the same for each criterion. For instance, nine responses mentioned the importance of the chemical composition of the lamp, while 12 mentioned the importance of cost.

Figure 14: Selection criteria for lamps as per respondents



None of the stakeholders contacted for the survey conducted on lamps used for electronic display sent back a filled questionnaire. However, it was gathered from verbal interactions that they were unaware about any level of mercury present in lamps which they generally purchase from importers. In their case also, LED lamps are favoured as alternatives. **4.4.3**

Analysis

In Mauritius, for general lighting a transition from incandescent bulbs and lamps to fluorescent lamps (e.g., CFLs) to LED lamps has been noted. The choice is largely influenced by availability and market price. For other applications, mercury vapor lamps and metal halide (halogen) lamps have been replaced by sodium vapor lamps, which are gradually being replaced by LED lamps. However, a 100% shift to LED lamps has not been achieved as the latter are more expensive compared to others with the same light output. In parallel, Mauritius is favoring alternative energy sources, e.g., from photovoltaic cells, in view of attaining a target of 35% of energy provided by renewable energy sources by 2030.

Lamp imports are subject to challenges such as delivery times. However, there could already be an incentive for mercury-free lamps if cargo companies charge extra fees for lamps whose mercury content may classify them as 'dangerous goods' for air or maritime shipment. Above all, it would be in the interest of the NFP and relevant stakeholders to ensure that the import data on lamps compiled by the CD also takes into account mercury contents of the lamps and not merely criteria based on Power, Voltage or Energy Efficiency Index (EEI).

4.4.4 Conclusions

Further research is needed on the types and numbers of lamps that are imported and used in Mauritius. The lamps used in households are different from those in sports complexes, stadiums, etc. The wide spectrum of lamps and users also poses a challenge in ascertaining the mercury content of the various types of lamps. Although this study generated only limited data on lamps, it would appear that meeting the 2020 target is feasible. As progress depends directly on the lamps available on the local market, in Mauritius most lamps are imported from China. However the latter should itself become fully compliant with the EU-ROHS directive and other applicable ones on lamps to be in line with the Convention's requirements.

4.5 Findings on power devices

In Mauritius, various electrical devices like switches, circuit breakers, sockets, plugs, etc., are imported and sold by large companies (brand representatives). Many of these products are supplied to local traders including hardware shops, wholesale shops, supermarkets, etc. This category of products encompasses a wide range of domestic and industrial applications (e.g., tilt switches previously used by vehicle and other manufacturers).

Similar to batteries and lamps, it was envisaged that importers and traders would report relevant data on power devices that they sell and distribute, based on their links with original suppliers and/or manufacturers of these products. However, no responses were received from any stakeholder except in one case where the trader's representative merely confirmed that their products are mercury-free.

Further data could be available via regulatory and industry stakeholders like the CD, the MoICCP or the Mauritius Chamber of Commerce and Industry (MCCI). In addition, a cross matching exercise could be undertaken to identify which applications or fields are dependent on the power devices that are locally available. Unlike in some other countries,

technical documents (e.g., IMERC²² factsheets published in the US) are not available in Mauritius for obtaining information on these products.

From the basic data gathered during the study, it could be inferred that the CEB does not use mercury-added relays any longer. About 100 old units from an obsolete stock are still available at the CEB at this time. Based on communications with stakeholders, older facilities and installations such as sugar milling companies and power plants commonly used the mercury-added devices, but more modern or upgraded facilities tend to use mercury-free alternatives. A few mercury-added devices are apparently still in use at some plants, though some steps have been initiated for replacement.

In conclusion, additional consultations and investigations are needed in order for the NFP to determine whether the 2020 target for power devices is achievable in Mauritius.

4.6 Findings on dental fillings

As mentioned in Chapter 3, for dental amalgams and alternative products the survey addressed only a few traders including one company that imports a variety of dental goods (floss, dental paste, etc.). In most cases the traders were running their own private dental practices in parallel. The Dental Services, a department under the MoHQL, was contacted on the status of the nine phase-down measures that are to be considered under Part II of Annex A of the Minamata Convention. Another survey was conducted on medical insurance companies in view of obtaining some information on medical coverage and claims for the dental sector.

4.6.1 Feedback from importers

Given that only four importers of dental filling materials took part in the survey, the data gathered does not represent the national situation in Mauritius. Elemental mercury and amalgamators are no longer imported by dental suppliers in Mauritius since the mid-2000s, following a decision from the MoHQL.

At present dental amalgams are imported in encapsulated form and supplied to private dentists, private clinics and to the MoHQL. According to the traders, a typical box contains 50 capsules. The countries of origin of the capsules include China, France, the UK and the US. The mercury-free (typically composite) filling materials are imported in syringes. The figures on dental amalgams as provided by four importers are presented in Table 21.

²²Members of the Interstate Mercury Education and Reduction Clearinghouse (IMERC) share data on relays and switches online. Many of them banned the sale of mercury-added power devices as early as 2001. For further details, see<<http://www.newmoa.org/prevention/mercury/imerc/factsheets/>>

Table 21: Imports of dental fillings by respondents

Year	Number of boxes of amalgam capsules				Number of syringes of composite fillings			
	T/DP/1	T/DP/2	T/DP/3	T/DP/4	T/DP/1	T/DP/2	T/DP/3	T/DP/4
2013	190	180	0	162	800	n/a	75	n/a
2014	0	200	0	153	345	n/a	75	n/a
2015	185	160	0	224	458	n/a	75	n/a
2016	n/a	n/a	0	694	n/a	n/a	75	n/a
Total	375	540	0	1 233	1 603	0	300	0

n/a = not available

According to the traders, each amalgam capsule contains less than 0.5 g mercury. The amount varies from 0.2 g to 0.4 g in the capsules imported by these suppliers. Considering an average of 200 boxes of dental amalgams imported per year by the three companies mentioned above, approximately two to four kilograms of mercury reach Mauritius via amalgams from these importers.

4.6.2 Data on numbers of dental fillings

Meetings with different stakeholders within the dental services sector in Mauritius revealed that MoHQL, the public healthcare provider, appears to be the main user of dental amalgams, while in private practice the composite fillings are favored.

In private dental facilities, the ratio of dental amalgams to composites varies depending on demands of patients and preferences of dentists. In some cases the ratio of dental amalgams to composites may be 50:50; in others, composite fillings are exclusively used, generally for aesthetic reasons.

In addition to the communications with dentists as described above, quantitative data was obtained from the Health Statistics Report 2015 published by the Ministry. Table 22 shows the number of dental amalgams and composite fillings placed in Mauritius and Rodrigues for the years 2011 to 2015.

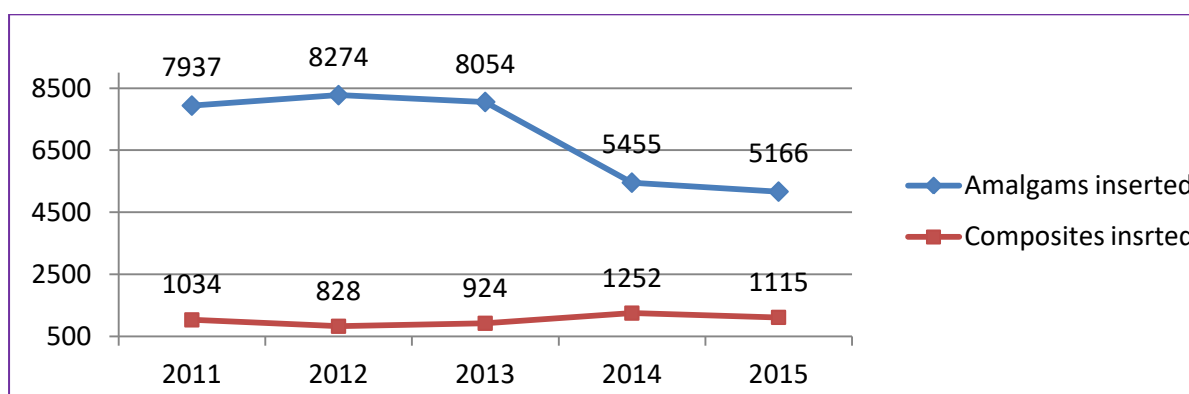
Table 22: Permanent dental fillings placed in Mauritius and Rodrigues

Year	Amalgams placed for children in		Amalgams placed for adults in		Composites placed for children in		Composites placed for adults in	
	Rodrigues	Mauritius	Rodrigues	Mauritius	Rodrigues	Mauritius	Rodrigues	Mauritius
2011	482	7 455	1 554	36 069	25	1 009	723	12 007
2012	402	7 872	1 989	36 856	23	805	647	13 225
2013	1 011	7 043	1 374	38 490	13	911	472	16 505
2014	813	4 642	1 401	32 000	36	1 216	605	18 975
2015	723	4 443	1 287	30 272	25	1 098	549	20 557
Total	3 431	31 455	7 605	173 687	122	5 039	2 996	81 269
Mean	686	6 291	1 521	34 737	24	1 008	599	16 254

Source: Health Statistics Report 2015, MoHQL

The overall trend from 2011 to 2015 in the use of dental amalgams and composite fillings for children in Mauritius and Rodrigues can be observed in Figure 15.

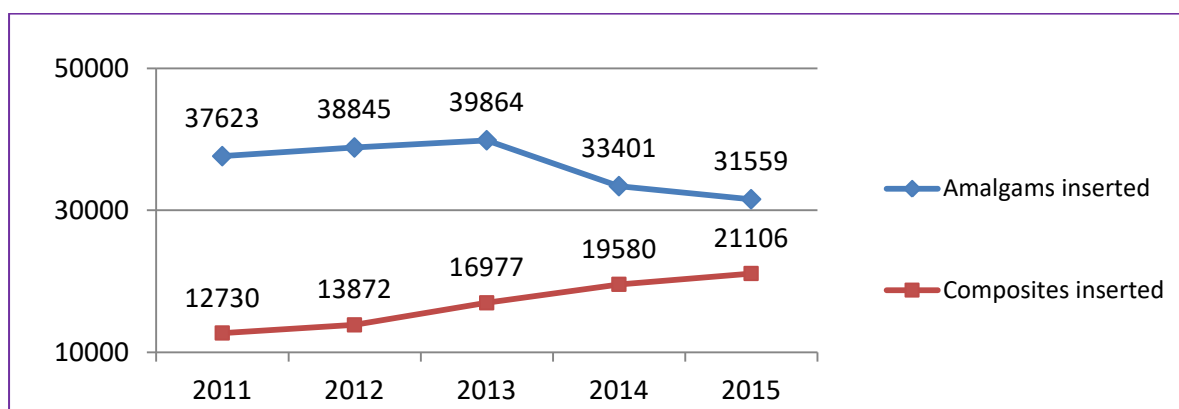
Figure 15: Trends in use of dental fillings in children



Source: Health Statistics Report 2015, MoHQL

The overall trend from 2011 to 2015 in the use of dental amalgams and composite fillings for adults in Mauritius and Rodrigues can be observed in Figure 16.

Figure 16: Trends in the use of dental fillings in adults



Source: Health Statistics Report 2015, MoHQL

Several interesting observations can be drawn from the above figures and Table 22:

- A general decrease has been noted in the use of dental amalgams, except for children in Rodrigues, where an increase has been noted twice.
- In children, the ratio of dental amalgams to composite fillings was approximately 19:1 in 2011 and 29:1 in 2015 for Rodrigues.
- In adults, the ratio of dental amalgams to composite fillings was approximately 2:1 in 2011 and 7:3 in 2015 for Rodrigues.
- In children, the ratio of dental amalgams to composite fillings was approximately 7:1 in 2011 and 4:1 in 2015 for Mauritius.
- In adults, the ratio of dental amalgams to composite fillings was approximately 3:1 in 2011 and 3:2 in 2015 for Mauritius.
- The number of composite fillings in children did not show a specific trend for either Rodrigues or Mauritius.
- There has been an increase in the use of composite fillings for Mauritian adults but not for Rodriguan adults.

4.6.3 Feedback from insurance companies

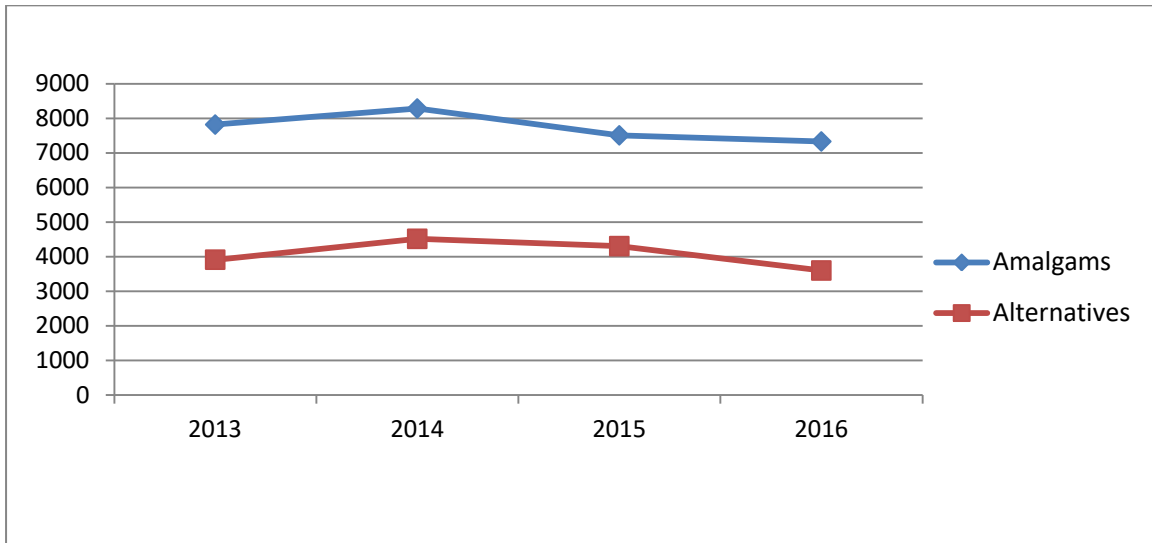
As mentioned in Section 3.7, a few health insurance companies were also contacted for information on coverage for dental fillings. Unfortunately, precise information on insurance claims was not available because dental professionals do not generally specify on their certificates which type of filling is placed.

The above situation was evident from the data provided by one health insurance provider operating in Mauritius for more than three decades. Based on its available data, the company made an assumption that claims for fillings under 1200 MUR²³ were for dental amalgams and those above MUR 1200 were for the alternative fillings. Under these assumptions, it appeared that dental amalgams were placed about twice as often as alternatives.

Under the above assumption, Figure 17 shows the dental claims received (i.e., self-claims and claims for dependents) by one insurance provider for the period 2013 to 2016.

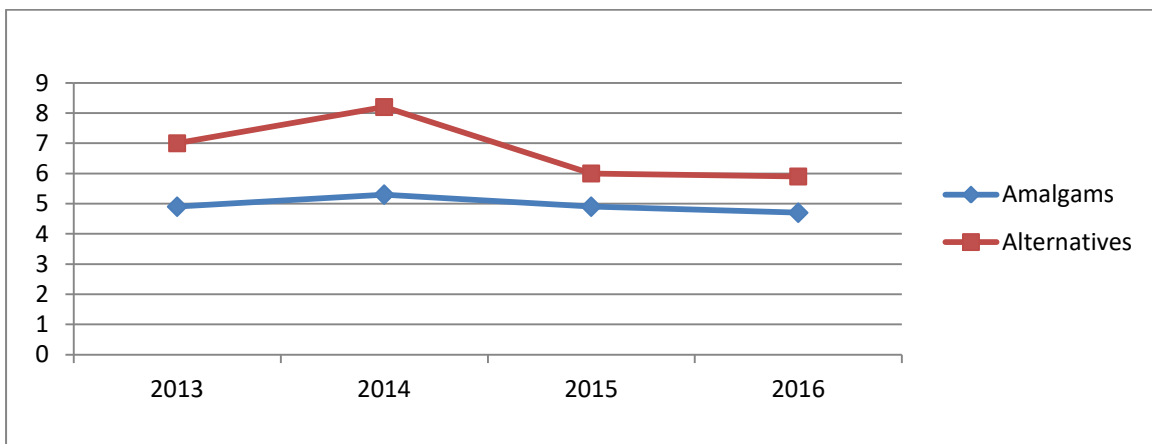
²³1 US Dollar was approximately 35 Mauritian Rupees (MUR) in December 2017.

Figure 17: Number of dental claims received



The amounts paid (re-imburements), in millions MUR, to policy holders further to the application of both types of fillings over the same period are shown in the next Figure.

Figure 18: Dental claims (in million MUR)



Additional data related to the age group and gender of patients submitting insurance claims, whilst information pertaining to demographic distribution, considered confidential, was not shared. Moreover, data on the dentists themselves, which would have differentiated those in private practice from the public sector and their demographic distribution, could not be made available.

Based on data shared by the insurance company, Table 23 provides a breakdown of the age group and gender of the patients to whom fillings were administered, (i.e. not representative of the situation for the whole of Mauritius).

Table 23: Age and gender distribution of patients

Number of patients who are:	Claims for dental amalgams				Claims for alternative fillings			
	2013	2014	2015	2016	2013	2014	2015	2016
Aged under 10 years	243	259	205	175	92	110	72	85
Aged 10 - 15 years	209	220	195	163	178	183	125	133
Aged 16 – 24 years	380	413	310	304	326	363	259	265
Aged 25 – 40 years	1642	1829	1549	1457	1114	1278	934	907
Aged 41 – 59 years	1469	1500	1358	1168	1169	1306	1071	1035
Above 60 years	233	254	231	301	216	245	255	251
Female	2231	2306	2069	1884	1614	1769	1406	1428
Male	1927	2158	1771	1675	1477	1709	1304	1240

4.6.4 Analysis

Despite being the largest user of dental amalgams, since the mid-2000s the MoHQL does not allow amalgams in children under the age of 10 and in pregnant women.

The cost of the filling is the decisive factor for many patients. From information gathered, alternative fillings cost approximately three times the cost of amalgams, not taking into account the societal and environmental costs of disposal.²⁴ This continues to be the main reason that dental amalgams are used in public healthcare, along with the claim some dentists make that amalgams have a comparatively longer life-time.

Insurance companies providing medical/health coverage may not have precise data on amalgam use, but they appear willing to collaborate in the interest of human health and the environment. That cooperation should help the MoHQL to implement the Minamata Convention’s requirement for phasing-down amalgams.

4.6.5 Conclusions

Overall, since the dental health sector in Mauritius is well structured (comprising the Dental Health Service of the MoHQL and associated dental clinics, the Medical and Dental Council and dentists’ associations), there should be no difficulty in phasing down the use of dental amalgam, especially as the range of mercury-free filling materials continues to expand, and the cost continues to decline. Besides, other activities undertaken by the MoHQL are in line with the measures listed in Annex A, Part II of the Minamata Convention, such as promoting better oral hygiene, which will reduce the overall incidence of caries and the need for dental fillings.

²⁴ An assessment of these costs may be found at http://www.zeromercury.org/index.php?option=com_phocadownload&view=file&id=158:the-real-cost-of-dental-mercury&Itemid=70

4.7 Findings on other products

This section presents the findings of the study on non-surveyed products and some other products listed in Annex A of the Minamata Convention.

4.7.1 Cosmetic products

There are no import restrictions for mercury-added cosmetics in Mauritius. The main sources of imported cosmetic products, which greatly outweigh the locally manufactured cosmetic products, are from EU and Asian countries according to CD data. They include famous international brands marketed by large importers of consumer or pharmaceutical goods at their retail outlets or other distribution points. Cosmetic products may also be sold in supermarkets, retail shops, groceries, etc., and even by individual salespersons.

The pictures below show some of the creams observed during field research.

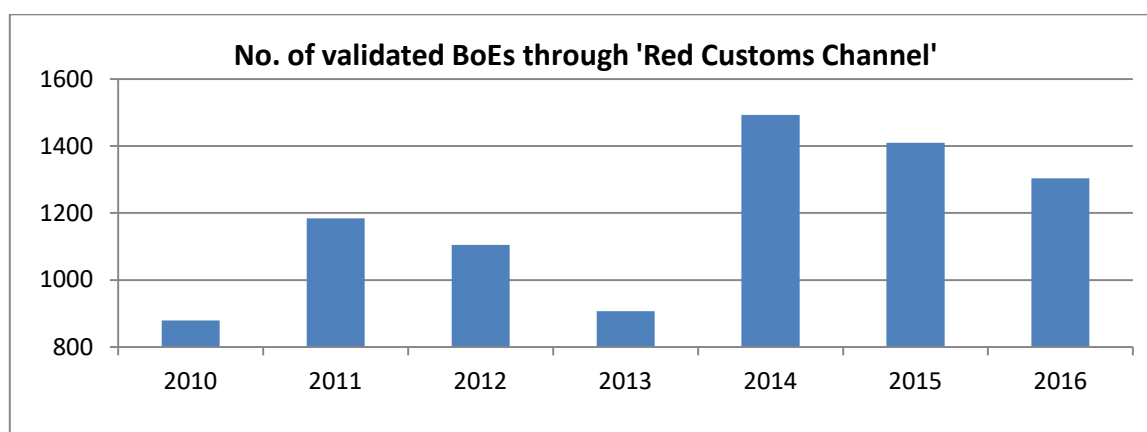
Picture 6: Cosmetic products sold in retail



At present there are no legal prohibitions against the import of mercury-added cosmetics into Mauritius. Nevertheless, based on data from the CD, 40 cases of imported mercury-added creams were seized at the seaport over the past five years. In addition, 104 creams sent by individuals from outside Mauritius were seized by CD staff at the Parcel Post Office in 2016 and 2017.

The following figure shows the number of validated BoEs declared via the 'red channel' for cosmetic products (bearing HS Codes 3104) on a yearly basis in Mauritius.

Figure 19: Trends in physical inspections for cosmetic products



Source: CD, MRA

As noted in Figure 19, there is no special trend in physical inspections (red channel) of cosmetic products by the CD. Thus, the average number of cosmetics inspected during 2010-2016 was 1183.

In February 2017, the Pharmaceutical Services, MoHQL, officially issued to the CD a list of 11 brands of creams for which clearance should not be allowed. The imported mercury-added cosmetics seized by the CD are kept under their jurisdiction in secure storage, together with other seized goods.

4.7.1.1 Challenges

It was discovered that lesser-known brands of cosmetic products, including fakes, are informally marketed and consumers may be easily drawn to their lower prices. Especially during festive seasons, such products are often sold in the informal market.

Other challenges are related to the marketing of these products. It is not in the interest of manufacturers to mention the level of mercury on their packaging, even if the product is less than the “acceptable” limit of 1 ppm.

Cosmetic products may be imported via e-commerce,²⁵ complicating efforts to prevent the entry of mercury-added cosmetic products into Mauritius, especially as there are also considerable quantities of mercury-free cosmetic products imported.

4.7.2 Pesticides and biocides

Pesticides imported into Mauritius do not contain any mercury according to data gathered from the DCCB, which has set very strict conditions on the import of mercury or mercury compounds. All importers of pesticides must furnish technical documentation like Safety

²⁵ In 2016, the MPL registered a 35-40% rise in total e-commerce transactions for all products and services in Mauritius.

Data Sheets (SDS), experimental trials or product assays whereby information on the chemical composition of pesticides is clearly described. Any breach by the importers is likely to affect their import permit.

A mercury compound is sometimes added to paint for its biocidal properties. There are fewer than ten paint manufacturing companies operating in Mauritius. They mostly produce paints for concrete and wooden surfaces, i.e., for the building construction and furniture industries. Very few companies also supply paints for the automobile industry, ship-building or similar applications (i.e., for metallic surfaces.) According to local companies, no mercury compounds are used in the production of their paints, although some paints employed for the applications described above are imported.

Paints used in road markings and for traffic signs are both manufactured locally and imported. According to information gathered from the Road Development Authority (RDA) under the Ministry of Public Infrastructure, mercury-free road marking paints are procured from suppliers, who also need to provide compliance certificates of their paints.²⁶ While mercury in paints is not a major source of concern, there may be cases of informally imported paints that avoid regulatory controls.

Overall, pesticides and biocides appear to be well regulated in Mauritius. Their production and use should be in compliance with SAICM. Moreover, under the Rotterdam Convention,²⁷ which requires Prior Informed Consent (PIC) for the trade of hazardous substances, parties are kept informed about any mercury-added compounds.

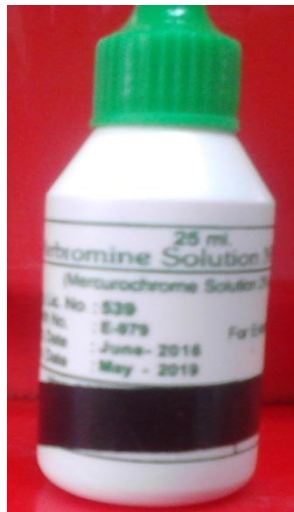
4.7.3 Topical antiseptics

Mercury-added antiseptics known as '*Medecine Bleu*' and '*Mercurochrome*' were once commonly available in Mauritius and even used to treat patients at the MoHQL facilities. Following a MoHQL decision in the mid-2000s, these products may no longer be imported officially. It appears, however, that there may be some imports circumventing the MoHQL decision. In one pharmacy visited during the study, the antiseptic was available in a 25 ml pack as shown in the picture below.

²⁶ The MSB has developed a Mauritian Standard for road marking paints and importers need to comply with that standard.

²⁷ Mauritius acceded to the Rotterdam Convention in November 2005. The MoHQL is the national focal point.

Picture 7: Locally purchased topical antiseptic



Sales of antiseptics are not restricted to chemist shops in Mauritius. Various types of antiseptics in the form of creams, gels, lotions, soaps, etc., may also be available in supermarkets, retail shops, groceries, etc. Most of these products are mercury-free and may include antiseptics based on natural products, e.g., herbal oils and other natural extracts.

5.0 Conclusions

5.1 General conclusions

On the basis of the information collected, it may be concluded that Mauritius is in a good position to meet the 2020 phase-out date for most mercury-added products. Although further consultations with stakeholders are encouraged especially for mercury-added lamps and power devices, the transition towards Convention-compliant products appears feasible, assuming a coherent government strategy is in place.

In developing such a strategy, the details of which are outside the scope of this report, different factors need to be considered in order for the shift to Convention-compliant products to be successful. The following figure provides a structure for considering these factors, including two examples in each case.

Figure 20: Factors for influencing the transition

Regulatory	<ul style="list-style-type: none">• Enhancement of the institutional and legal framework• Procurement policies need to favour Convention-compliant products
Operational	<ul style="list-style-type: none">• Performance-related characteristics, e.g., calibration should be included• Foster greater user confidence in Convention-compliant products
Commercial	<ul style="list-style-type: none">• Marketing /advertising should favour Convention-compliant products• Public-private sector partnerships can assist the transition
Psycho-social	<ul style="list-style-type: none">• 'Resistance to change' should be understood and dealt with• Awareness-raising of mercury as a hazardous substance in products
Quality	<ul style="list-style-type: none">• Products should be in compliance with international standards• Consumer / user safety aspects of products to be considered
Economic	<ul style="list-style-type: none">• Fiscal measures should discourage imports of mercury-added products
Environmental	<ul style="list-style-type: none">• Foster the 'Precautionary Principle' and other best practices• Waste collection / disposal / recycling / storage of mercury-added products

The table below summarizes the status of each product category in view of meeting the 2020 targets stipulated in Annex A of the Minamata Convention.

Table 24: Meeting Convention targets for mercury-added products

Product category	Remarks
Batteries	<ul style="list-style-type: none"> • Mercury-added batteries are already prohibited under the Control of Import Regulations, CPA. • The issue of fake brands needs further scrutiny.
Cosmetic products	<ul style="list-style-type: none"> • No comprehensive legislation covers these products. • Cosmetic products that could be problematic, e.g., fairness creams, are readily available in the local market, and the mercury content is unknown.
Lamps	<ul style="list-style-type: none"> • Information on levels of mercury in imported lamps is not readily available. • Further consultation among stakeholders is needed.
Measuring devices	<ul style="list-style-type: none"> • Knowledge of the imports and uses of the five categories of measuring devices varies widely from one product to another. • Further consultation among stakeholders is needed, although a significant shift towards Convention-compliant devices has already been achieved.
Pesticides & Biocides	<ul style="list-style-type: none"> • Imports of pesticides / biocides are regulated in Mauritius. • Issue of biocides in paints warrants further scrutiny in case of informal imports.
Power devices	<ul style="list-style-type: none"> • Little data is available on these products in Mauritius. • No comprehensive legislation covers these products.
Topical antiseptics	<ul style="list-style-type: none"> • Improved enforcement is needed as mercury-added antiseptics are still available on the market.

Some lessons learnt also emerged from the study, including the following:

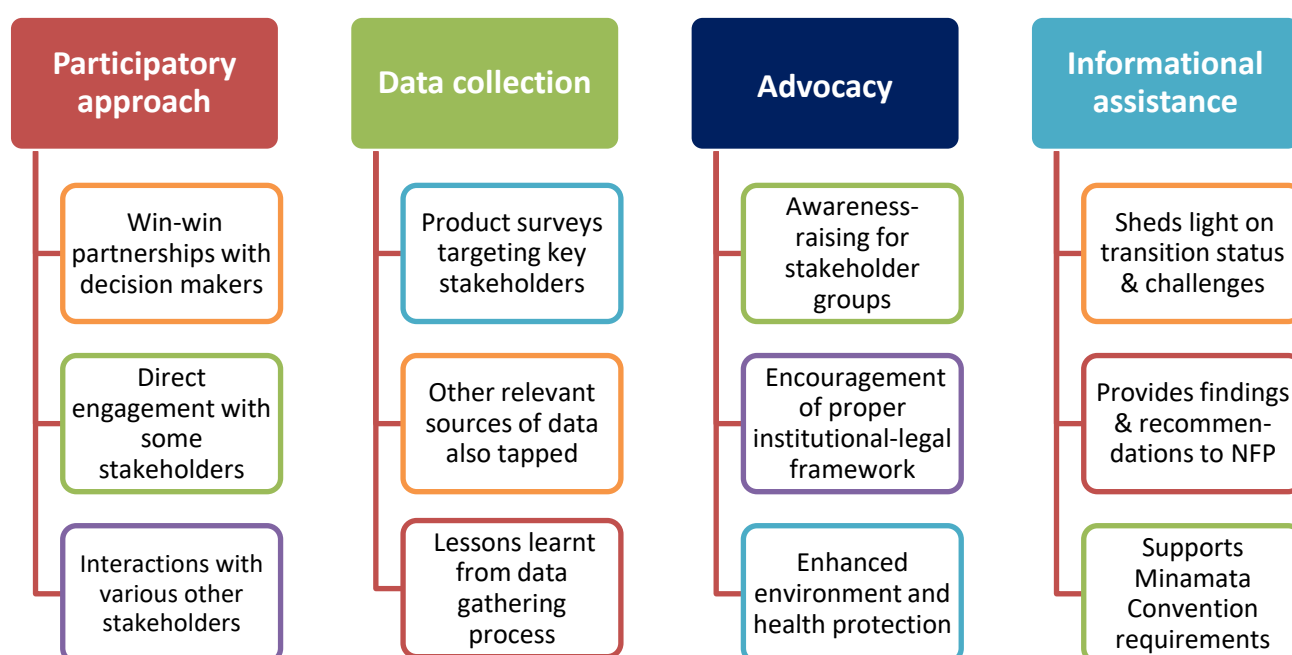
- There is a general lack of knowledge/awareness about mercury-added products and the requirements of the Minamata Convention.
- The formal supply chain of products of interest, based on the data currently available, is not as transparent as one would hope.
- Some fake and lesser known brands of products of interest (mostly skin-lightening creams) represent a source of income for some people, and may require different approaches than those addressing the formal supply chain.

5.2 The way forward

This study has collected and analyzed important Mauritian data on the products of interest to the implementation of the Minamata Convention. Moreover the study has also looked into different implications and challenges for the transition towards Convention-compliant products in Mauritius.

Besides the complementarity with the national-level MIA project, the study delivers value to Mauritius in a number of other ways, as summarized in Figure 21 below.

Figure 21: Added value of the study



In order to ensure an effective and efficient transition to meeting the Annex A requirements for Convention-compliant products, a number of recommendations have been formulated based on the findings of the study. They are listed in Table 25 below, though not presented in any particular order of priority.

Table 25: Project recommendations

Recommendations	Justifications
Formulation of specific HS codes for products of interest. Mauritius, along with other importing countries, could take this initiative via regional platforms such as the SADC, COMESA, etc.	With specific HS codes defined for products of interest, it would be possible to better differentiate between products in compliance with Annex A and those that are not. This would also facilitate data collection for monitoring the transition towards Convention-compliant products.

Recommendations	Justifications
Awareness-raising campaigns on mercury-added products and related issues (e.g., risks to human health and the environment). Campaigns can be waged via TV, radio, posters, internet, social media, etc., for wider stakeholder coverage.	A very low level of awareness of mercury-added products was observed during the various interactions with stakeholders.
Capacity-building activities (training, workshops, etc.) for specific groups, e.g., Customs Officers, Consumer Protection officers, etc., to alert them to specific Convention mandates.	Implementation of product-related requirements of the Minamata Convention on Mercury may require more training, staffing and facilities for them to carry out their duties.
a) Introduction of procurement policies for encouraging the specification and purchase of Convention-compliant products. b) In public procurement policy, bidders can offer to use or provide only products in compliance with the Convention.	Several types of institutions surveyed (e.g., public and private sector, local authorities, service providers, academic institutions, etc.) do not currently have policies in place to promote the procurement of Convention-compliant products.
Increasing compliance verifications of goods at entry points (i.e., airport, seaport, parcel post, freeport) for products of interest to the Convention.	The number of imported products, online purchases, passenger movements, etc., keeps increasing due to greater connectivity with other countries whilst only 5% of imported goods are subject to verifications.
More frequent testing of goods for the presence of mercury.	Test certificates from the country of origin are not always submitted by importers to Mauritian authorities.
Ensuring that imported products listed in Annex A Part I are accompanied by complete and accurate information on product labels or packaging, or technical data sheets before they are granted customs clearance.	It has been observed that some product labels or accompanying information is incomplete or in languages that many Mauritians do not understand.
a) Discouraging the sale and distribution of products of interest (e.g., batteries) that do not indicate the absence or permitted presence of mercury.	Many product labels and/or packaging fail to indicate the absence or presence of mercury.
b) Assistance of the MSB in formulating standards for relevant products, especially skin-lightening creams and other beauty products.	Mauritius has a national standards body which has already devised Mauritian Standards (MS) for some imported products, e.g., toys and fireworks.
For the various products in Annex A of the Convention, national record-keeping on trends or supply chains (at least until the 2020 phase-out date) should be strongly encouraged.	Through surveys conducted, it was noted that not all traders keep appropriate and easily-traceable records of the products of interest, whereas Article 4 of the Convention requires Parties to keep appropriate records of products.

Recommendations	Justifications
Provide incentives for companies to import Convention-compliant products (e.g., lower tariffs on Convention-compliant lamps) during the transition period, in the lead-up to a ban in 2020.	Trading companies should be encouraged to provide Convention-compliant products until such time as non-compliant products are no longer permitted to be sold. 'Dangerous Goods Fees' are already applicable for the transport of mercury-added products and mercury compounds.
The private sector should provide support to government authorities to encourage the shift towards Convention-compliant products via education & training, holding product seminars, comparative performance testing between products, etc.	The private sector has direct links with original suppliers, regional distributors and/or product manufacturers based outside the country. Partnerships between them and the public sector would facilitate the transition towards Convention-compliant products.
Academic and technical institutions should develop training modules addressing repairs and maintenance of mercury-free measuring devices and Convention-compliant switches and relays as used in various applications.	The encouragement of appropriate technical skills for using, maintaining and repairing Convention-compliant devices would enhance their viability and accelerate the transition.
In the long term, the Customs Department may consider in the acquisition of modern instruments e.g. portable X-ray Fluorescence spectrometers for the detection of mercury in incoming products at points of entry, including relevant training of its staff for using these.	Existing scanning devices used by CD staff are not be able to flag mercury in incoming goods whilst traders may not be declaring their products as 'dangerous goods' if ever the latter contain mercury.

5.2.1 Multi-stakeholder engagement

Many stakeholders implicated in the Minamata Convention were identified and contacted during this study, and their roles and responsibilities during the transition towards Convention-compliant products should not be underestimated. Under the lead of the Convention's National Focal Point (the Ministry of Environment), and in their own interest, these stakeholders should collaborate in addressing key issues and tackling any challenges that hinder the transition.

The following table presents a matrix of stakeholders and corresponding product categories that will be useful for setting up or expand relevant technical working groups, and gathering better data. As per Paragraph 4 of Article 4 of the Minamata Convention, Parties are required to furnish to the Secretariat data on both mercury-added products and their alternatives, enabling the Secretariat to make such data publicly available.

Table 26: Stakeholders and product categories

Stakeholders	Products									
	Batteries	Cosmetics	Dental fillings	Lamps	Lab thermometers	Medical thermometers	Sphygmomanometers	Pesticides & biocides	Power devices	Topical antiseptics
Assoc. des Consommateurs de l'île Maurice	X	X	X	X						X
Assoc. des Hôteliers et Restaurateurs de l'île Maurice		X								
Customs Department / Mauritius Revenue Authority	X	X	X	X	X	X	X	X	X	X
Central Electricity Board				X					X	
Clinical Regulatory Research Council		X								
Dangerous Chemicals Control Board		X						X		X
Energy Services Division / Energy Management Office				X					X	
Local Authorities (City / District / Municipal Councils)				X					X	
Mauritius Examinations Syndicate					X					
Mauritius Chamber of Commerce & Industry	X	X		X					X	
Medical and Dental Council of Mauritius			X			X	X			
Min. of Education HR TE SR					X					
Min. of Finance & ED	X	X	X	X	X	X	X	X	X	X
Min. of Health & QL		X	X			X	X	X		X
Min. of Industry, Commerce & CP (including MSB)	X	X	X	X	X	X	X	X	X	X
Min. of Labour, E, IR & T	X	X	X	X	X	X	X	X	X	X
Min. of Local Government				X						
Mauritius Standards Bureau					X	X	X			
Min. of Environment & SD (NFP)	X	X	X	X	X	X	X	X	X	X
Nursing Association of Mauritius			X		X	X	X			
Pesticides Action Network Mauritius	X	X	X	X	X	X	X	X	X	X
Private Secondary Education Authority					X					
Rodrigues Regional Assembly	X	X	X	X	X	X	X	X	X	X
State Law Office	X	X	X	X	X	X	X	X	X	X
Statistics Mauritius	X	X	X	X	X	X	X	X	X	X
University of Mauritius					X	X	X		X	
University of Technology Mauritius					X	X	X			

X = Relevant for the product

5.3 Final remarks

Mercury has attracted increasing attention due to its risks to human health and the environment. The advent of the Minamata Convention on Mercury shows the worldwide importance given to reducing and where possible eliminating mercury use, including in mercury-added products. Accordingly, discouraging the use of mercury-added products while, at the same time, promoting the trade and use of Convention-compliant products

should be enhanced over time. As evidenced by the 2015-2020 Mauritius National Action Plan to manage mercury, the use and disposal of products represent the largest source of all mercury releases.

This study has confirmed that a complete shift to Convention-compliant products has not yet taken place in Mauritius. However, the phase-out of the manufacture and import of most, if not all products covered by the Convention is achievable by 2020. To that end, Mauritius may need to increase its efforts to facilitate the transition. Such initiatives should include raising awareness, capacity-building, increased regulatory checks, the creation and upgrading of databases, collaboration between various Ministries, and measures engaging relevant stakeholders as well as the general public.

6.0 REFERENCES

UNEP (2013): *Minamata Convention on Mercury*. Available at <http://www.mercuryconvention.org>

UNDP (2016): *Mercury for Sustainable Development*. Available at file:///C:/Users/USER/Downloads/Mercury%20publication_ENGLISH.pdf

European Commission: *Restriction of Hazardous Substance*. Available at http://ec.europa.eu/environment/waste/rohs_eee/index_en.htm

World Health Organisation (2015): *Developing national strategies for phasing out Mercury-containing thermometers and sphygmomanometers in health care, including in the context of the Minamata Convention on Mercury*. Available at http://www.who.int/ipcs/assessment/public_health/WHOGuidanceReportonMercury2015.pdf?ua=1

Northeast Waste Management Officials' Association. *Mercury Reduction Programs*: Available at <http://www.newmoa.org/prevention/mercury/publications.cfm>

Statistics Mauritius (October 2016): *Total Imports, Digest of External Merchandise Trade Statistics Year 2015*.

Mauritius Chamber of Commerce and Industry (2016): *Mauritius, The Economy in Figures, 2014 – 2015*. Available at <http://www.mcci.org/media/139179/economicinfigures.pdf>

Ministry of Health & Quality of Life (2004): *Dangerous Chemicals Control Act 2004*. Available at <http://health.govmu.org/English/Documents/dccb.pdf>

Ministry of Labour, Employment & Industrial Relations (2005): *Occupational Safety & Health Act 2005*. Available at <http://labour.govmu.org/English/Documents/Legislations/osha%202005/act/2.%20OCCUPATIONAL%20SAFETY%20AND%20HEALTH%20ACT%202005.pdf>

Ministry of Industry, Commerce and Consumer Protection (1991): *Consumer Protection (Control of Imports) Regulations 1999*. Available at <http://commerce.govmu.org/English/Legislations/Documents/GN%20135%20of%201999.pdf>

Ministry of Industry, Commerce and Consumer Protection (1991): *Toy (Safety) Regulations 1994*. Available at <http://consumer.govmu.org/English/Documents/Consumer%20Protection/Legislations/act1991.pdf>

Mauritius Standards Bureau: *List of Calibration Services*. Available at

http://msb.intnet.mu/English/Documents/MSB/Services/Metrology/list_of_calibration.pdf

Health Statistics Unit, Ministry of Health & Quality of Life: Health Statistics Report 2015 (National Health Report 2015). Available at

<http://health.govmu.org/English/Statistics/Health/Mauritius/Documents/NATIONAL%20REPORT%202015.pdf>

Zero Mercury Working Group (2013: Assessing hair mercury levels of women of childbearing age in 9 countries : A civil society pilot project.

Ministry of Environment and Sustainable Development (2014) : Mauritius National Action Plan on Mercury (2015 – 2020)

Customs Department, Mauritius Revenue Authority (2016) : Customs Tariff Schedules (Integrated Tariff) HS Versions 2012

European Environmental Bureau (2016): Press release. Available at <http://www.eeb.org/?LinkServID=DAACFOA2-5056-B741-DBB26BE8CD4AF4EA&showMeta=0&aa>

Board of Investment: Clinical Research in Mauritius (2011). Available at

<http://www.investmauritius.com/media/33332/Guidelines-Clinical-Research-in-Mauritius.pdf>

Ministry of Finance and Economic Development, Republic of Mauritius (2016): Budget speech 2016/2017. Available at

<http://budget.mof.govmu.org/budget2017/budgetspeech2016-17.pdf>

United Nations Environment Programme (2015): A practical sourcebook on Mercury wastes and disposal.

Pesticides Action Network Mauritius (2016): A report of mercury levels in selected hotspots in Mauritius.

7.0 APPENDICES

I) Mercury-added products

According to Annex A of the Minamata Convention, mercury-added products are grouped as follows:

❖ **Products which are excluded from Annex A:**

These products have specific applications and are as follows:

- Products essential for civil protection or military uses.
- Products for research, calibration or use as reference standard.
- Products used in traditional or religious practices.
- Vaccines containing thiomersal (a compound of mercury) as preservative.
- Any products for which there are no feasible mercury-free alternatives to those listed below.

❖ **Products featuring in Part I of Annex A:**

The manufacture, export or import of these specific products (below) shall not be allowed after 2020 (phase-out deadline):

Product category	Specific types of products	Remarks / Characteristics (if any)
Batteries	All	Zinc-silver-oxide and zinc-air button cells with < 2% mercury would be allowed
Cosmetic products	<ul style="list-style-type: none"> • Skin-lightening soaps • Skin-lightening creams 	mercury content > 1 ppm, but excluding eye area cosmetics using mercury preservatives for which no effective and safe substitute is available
Lamps (for general lighting purposes)	<ul style="list-style-type: none"> • Compact fluorescent Lamps (CFLs) • Linear fluorescent Lamps (LFLs) • High pressure mercury vapour (HPMV) lamp 	<ul style="list-style-type: none"> - CFLs of power ≤ 30 W and containing > 5 mg mercury - Triband phosphor LFLs of power < 60 W and containing > 5 mg mercury - Halophosphate phosphor LFLs of power ≤ 40 W and containing > 10 mg mercury
Lamps (for electronic displays)	<ul style="list-style-type: none"> • Cold cathode fluorescent lamps (CCFLs) • External electrode fluorescent lamps (EEFLs) 	<ul style="list-style-type: none"> - CCFLs/EEFLs of length ≤ 0.5 m and containing > 3.5 mg mercury - CCFLs/EEFLs of length between 0.5 m and 1.5 m, and containing > 5 mg mercury - CCFLs/EEFLs of length > 1.5 m and containing > 13 mg mercury
Non-	<ul style="list-style-type: none"> • Barometer 	Except non-electronic measuring devices installed

Product category	Specific types of products	Remarks / Characteristics (if any)
electronic measuring devices	<ul style="list-style-type: none"> • Hygrometer • Manometer • Thermometer • Sphygmomanometer 	in large-scale or high precision equipment for which no suitable alternatives exist.
Pesticides & pharmaceuticals	<ul style="list-style-type: none"> • Biocides • Pesticides • Topical antiseptics 	
Power devices	<ul style="list-style-type: none"> • Switches • Relays 	Except very highly specific switches and relays with > 20 mg mercury

Source: Minamata Convention on Mercury

❖ Products featuring in Part II of Annex A:

At present, only dental amalgams are listed in Part II and these should only be phased down, i.e., no deadline is applicable. The phasing down approach shall take into account the Party's domestic circumstances and relevant international guidance for it to adopt at least two of the nine measures listed below:

- (i) Setting national objectives aiming at dental caries prevention and health promotion, thereby minimizing the need for dental restoration,
- (ii) Setting national objectives aiming at minimizing the use of dental amalgams,
- (iii) Promoting the use of cost-effective and clinically-effective mercury-free alternatives for dental restoration,
- (iv) Promoting research and development of quality mercury-free materials for dental restoration,
- (v) Encouraging representatives of professional organizations and dental schools to educate and train dental professionals and students on the use of mercury-free dental restoration alternatives and on promoting best practices,
- (vi) Discouraging insurance policies and programmes that favour dental amalgam use over mercury-free dental restoration,
- (vii) Encouraging insurance policies and programmes that favour the use of quality alternatives to dental amalgam for restoration,
- (viii) Restricting the use of dental amalgam to its encapsulated form,
- (ix) Promoting the use of best environmental practices in dental facilities to reduce releases of mercury and mercury compounds to water and land.

II) Project Advisory Committee

No	Name	Designation	Institution
1	Mr. Hemsing Hurrynag	Project Manager	PANeM
2	Ms. Priya Gobardhan	Administrative Secretary	PANeM
3	Mr. Rajiv Beedassy	Divisional Environment Officer	Department of Environment (MoE) / NFP
4	Mrs. Daisy Tatur-Ramasamy	Environment Officer	Department of Environment (MoE) /NFP
5	Mr. Satyajeet Ramchurn	Environment Programme Officer	United Nations Development Programme
6	Mrs. Vichitra Purdassee	Project Manager MIA	United Nations Development Programme
7	Mr. Prakash Kowlessar	Director	Solid Waste Management Division (MoE)
8	Dr. (Mrs.) T. Chetty	Occupational Health Physician	Occupational Health Unit, Ministry of Health & Quality of Life
9	Ms. Shalini Multra	Analyst (Trade)	Trade Division, Ministry of Industry, Commerce & Consumer Protection
10	Mr. D. Dhunnoo	Scientific Officer	Albion Fisheries Research Centre, Ministry of Ocean Economy, Marine Resources, Fisheries and Shipping
11	Dr. (Ms.) Raksha Dhunpath	Dentist	Association of Dental Professionals
12	Mr. MahenSeeborun	President	Falcon Citizen League (NGO)
13	Mr. Niven Muneesamy	Secretary	Mauritius Council of Social Service (MACOSS)
14	Mrs. Shivani Georgijevic	Legal Consultant	University of Mauritius
15	Mr. Shailand Gunnoo	Project Consultant	Independent Consultant

III) Mercury-added and alternative products imported by Mauritius (2010-2016)

	Imported products	HS Code	Quantity (kg)	Quantity (units)	cif value (MUR)
Batteries	Manganese dioxide	8506.10		15 309 273	138 739 184
	Mercuric oxide	8506.30		625 956	7 003 362
	Silver oxide	8506.40		114 227	1 466 252
	Lithium	8506.50		242 349	10 128 347
	Air zinc	8506.60		211 176	2 518 885
	Other primary cells and batteries	8506.80		493 310 177	1 447 559 420
	Battery parts	8506.90	855	--	330 269
	Total		855	509 813 158	1 607 745 719
Cosmetics	Lip make-up preparations	3304.10	313 769		136 678 561
	Eye-make up preparations	3304.20	312116	--	128 445 463-
	Manicure or pedicure preparations	3304.30	341 610	--	129 294 553
	Other beauty or make-up preparations	• 3304.91 • 3304.99	8 383 510	--	5 393 199 335
	• Shampoos • Hair straighteners • Hair lacquers • Other hair preparations	• 3305.10 • 3305.20 • 3305.901 • 3305.909	6 788 712	--	1 179 003 155
	Bath salts and preparations	• 3307.30	408 398	--	15 498 269
	Soaps & organic surface active products (Ionic, non-ionic, etc.)	• 3401.10 • 3401.20 • 3401.30.	46 176 245	--	1 914 618 677
	Total		62 724 360	--	8 896 738 013

	Imported products	HS Code	Quantity (kg)	Quantity (units)	cif value (MUR)
Lamps	Portable electric lamps	8513.10		89 164 748	233 864 648
	Indicator panels with liquid crystal or LED	8531.20		356 202	21 973 615
	Sealed beam	8539.10	--	1 221 988	17 838 775-
	• Tungsten halogen lamps • Filament lamps < 200 W and > 100 W • Other filament lamps	• 8539.211 • 8539.221 • 8539.291	--	5 796 482	71 814 922--
	• Discharge lamps	• 8539.310 • 8539.399	--	16 355 705	210 591 275
	• Fluorescent discharge • Other fluorescent hot cathode lamps	• 8539.311 • 8539.319		2 455 567	48 617 036
	Mercury or sodium vapor; metal-halide lamps	8539.32	43 702		34 845586
	Low energy consumption lamps	8539.391	--	8 667 463	280 293 480
	Light Emitting Diode (LED) lamps	8539.392	--	3 477 324	230 915 055
	Arc lamps	8539.41	--	30 457	5 185 496
	UV or IR lamps	8539.49	--	--	41 176 255
	Electronic discharge lamps, flashlights and apparatus	9006.61	--	2 241 460	9 467 762
	Lamps using solar energy	• 9405.102 • 9405.202 • 9405.402	189 545	--	41 324 284
	Lamps used in operation theatres or by dental surgeons	• 9405.103 • 9405.403	13 580	--	34 800 046
	Total		203 125	130 560 300	1 224 091 137

Imported products		HS Code	Quantity (kg)	Quantity (units)	cif value (MUR)
Measuring devices	Liquid-filled Thermometers for direct reading	9025.11		3 149 921	10 514 950
	Other thermometers	9025.19	--	330 364	65 388 920
	Other instruments	9025.80		225 485	60 467 338
	Parts and accessories	9025.90	5 168	--	18 948 828
	Instruments for checking or measuring flow/levels of liquids	9026.10	--	50 169	214 739 599
	Instruments for checking or measuring pressure	9026.20		2 479 546	431 185 503
	Other instruments (flow meters, manometers, heat meters, hygrometers)	9026.80		84 365	120 861 470
	Other parts and accessories	9026.90	16 782	--	37 540 172
Total			21 950	6 319 850	959 656 380
Pesticides	Insecticides (including mosquito mats) & Acaricides	• 3808.910 • 3808.912 • 3808.919	6 458 845	--	1 094 700 439
	Fungicides	3808.92	1 566 640	--	336 107 966
	Herbicides	• 3808.931 • 3808.939	6 960 569	--	1 262 722 625
	Disinfectants	3808.94	777 437	--	138 818 775
	Rodenticides and Microbial preservative used in manufacturing processes	• 3808.991 • 3808.992 • 3808.999	1 269 244	--	180 547 607
Total			17 032 735		3 012 897 412
Power devices	• Residual current switches • Isolating switches & make-and-break switches • Dimmer switches • Other switches	• 8535.301 • 8535.309 • 8536.502 • 8536.509	1 550 821	--	901 651 549
	• Relays not exceeding 60 V • Residual current relays • Other relays	• 8536.41 • 8536.491 • 8536.499	180 489	--	261 296 910
	• Thermostats • Manostats	• 9032.10 • 9032.20		216 420	139 717 351
	Total		1 731 310	216 420	1 302 665 810
Dental fillings		3006.40	19 784	--	50 010 857

Products for which figures are not available are shown with '--'

The text below provides some further insights with regard to the available trade data for the years 2010-2016.

❖ **Batteries (HS Codes beginning with 85)**

- Products under HS Code 8506.60 include hearing aid batteries and other types.
- Products under HS Code 8506.80 include batteries for camera, remote control, hearing aids, clock & watch, etc.
- Customs data from 2010 to 2016 confirm that mercury-added batteries have been imported into Mauritius despite Import Regulations under the CPA.
- The amount of mercury present in batteries is not a criterion for classification of batteries in the CTS at present.

❖ **Cosmetics (HS Codes beginning with 33 and 34)**

- Products under HS Codes 3304.90, 3401 and 3402 encompass a wide range of products, including creams, lotions, gels, religious items, scents, skin products, soaps, etc.
- The amount of mercury present in the cream, soaps, etc., is not a criterion for classification of these cosmetic products in the CTS at present.
- A few of the products under HS Codes 3401 include products used in traditional or religious practices, e.g., 'bindis', 'sindoor', etc., which are exempted from Annex A if they contain mercury.

❖ **Lamps (HS Codes beginning with 85)**

- Products under HS Code 8535 are those exceeding 1 000 V
- Products under HS Code 8536 are those less than 1 000 V
- Products with Energy Efficiency Index (EEI) of 95% or more are compliant with the Standard MS 203:2011 (local standard)
- Criteria used for differentiating lamps are based on Power (in Watts), Voltage (in Volts) and EEI (as %) in the CTS, while the amount of mercury present in the lamp is not a criterion for HS Codes at present.

❖ **Measuring devices (HS Codes beginning with 90)**

- Apart from blood pressure monitors or sphygmomanometers, several types of medical equipment, e.g., electro-cardiographs, needles, MRI scanners, syringes, etc., are also listed under HS Code 9018.
- Products under HS Code 9025.80 include devices like temperature sensors, temperature & humidity data loggers, thermocouples, etc. Thus, some of these products are alternatives to conventional mercury-filled thermometers.

❖ **Pesticides (HS Codes beginning with 38)**

- Products under HS Code 3808.919 include anti-sprouting agents, mosquito coils & mats, anti-fly repellents, glue mats, etc.
- Products under HS Code 3808.92 include biocides used for coatings, paints, inks, etc.

❖ **Power devices (HS Codes beginning with 85 and 90)**

- Products under HS Codes 8535 and 8536 include relays and switches encompassing a wide range of alarm systems, lighting systems, sewing machines, ovens, electrical and electronic equipment (domestic and industrial purposes).
- Similar to lamps, the criteria used to differentiate these devices do not include the amount of mercury present in the device as stipulated in Annex A.

❖ **Dental products (HS Codes beginning with 30)**

- These products include amalgams and alternatives, as well as various dental products like dental cement, paste, floss, wax, etc.

IV) Authority letter



Date: 02.05.2016

TO WHOM IT MAY CONCERN

Re: Study on Mercury-added products and their alternatives in Mauritius.

Dear Sir/Madam,

Please refer to the above subject.

As you may be aware, Mercury is a substance toxic to human health and the environment. However it is still used in various products for specific applications even though Mercury-free alternative products have been produced for many of these same applications. Since 2013, more than 120 countries including Mauritius have signed the Minamata Convention on Mercury, a global treaty which aims to protect human health and the environment from anthropogenic emissions and releases of Mercury and Mercury compounds.

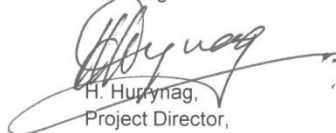
In the above context, the NGO Pesticide Action Network of Mauritius (PANeM) in collaboration with its international partners, the European Environmental Bureau and the Zero Mercury Working Group, is assisting the Ministry of Environment, Sustainable Development, Disaster and Beach Management (MoESDDBM), the United Nations Development Programme (UNDP), Mauritius and other stakeholders to progress towards the future ratification and implementation of the Minamata Convention on Mercury by Mauritius.

It is thus brought to your kind attention that Mr. Shailand K.S. Gunnoo, Independent Consultant, has been appointed by PANeM to conduct a study on Mercury-added products and Mercury-free alternative products in Mauritius. The terms of reference for Mr. Gunnoo to conduct this study have been duly documented in an official Contract and Agreement of services.

Accordingly, your kind collaboration is being sought for providing him with any assistance during his search for obtaining relevant data on Mercury-added products and their alternatives as applicable to your organisation/institution. The findings of the above mentioned study would be eventually presented to all relevant stakeholders in a project report.

Many thanks for considering the above.

Best Regards



H. Huprinag,
Project Director,
PANeM

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