

2018

# Minamata Initial Assessment Report: Cabo Verde



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Report issuing date	June 1 2018

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## Glossary

ANAS	National Agency for Water and Transportation
ARFA	Regulatory Agency for Pharmaceutical Products and Food
ASGM	Artisanal and Small-scale Gold Mining
BEL	Basic Environment Law
BRI	Biodiversity Research Institute
CFA	Cabo Verde Pharmacists Association
CFL	Compact Fluorescent Lightbulbs
CILSS	Inter-State Committee for Drought Control in the Sahel
CMA	Cabo Verde Medical Association
COP	Conference of Parties
CPLR	Cosmetics Products Legal Regime
CRCV	Constitution of the Republic of Cabo Verde
DGA	General Directorate of Customs
DGASP	General Directorate of Agriculture, Forestry and Livestock
DGDR	General Directorate of Rural Development Delegations
DGI	General Directorate of Industries
DNA	National Directorate of the Environment
DNS	National Directorate for Water and Sanitation
ECOWAS	Economic Community of West African States
GEF	Global Environment Facility
IGA	Institutional Gap Analysis
IGQP	National Institute of Quality Management and Intellectual Property
IGT	General Labor Institute
INIDA	National Institute for Agrarian Investigation and Development
INPS	National Institute for Social Security
INSP	National Institute for Public Health
LED	Light Emitting Diodes
MAE	Ministry of Agriculture and Environment
MAP	Mercury-added Products
MEE	Ministry of Economy and Employment
NAP	National Action Plan
NRDC	National Resources Defense Council
PENGER	National Strategic Plan for Waste Management
RC	Rotterdam Convention
UNIDO	United Nations Industrial Development Organization
WSC	Water and Sanitation Code

## **Foreword**

The Republic of Cabo Verde (Cabo Verde), in requesting funding for this report, gives a clear signal of its commitment to ratify the Minamata Convention. Cabo Verde has, in its history, ratified the main international conventions in several areas, confirming its commitment to be aligned with the major international principles and agreements.

The Minamata Convention calls for all countries to take responsibility for protecting human health and the environment from the risks of exposure to mercury. This protection should be implemented through systematic monitoring of mercury releases and emissions, e.g. to soil, atmosphere, and water. It also recommends that countries should promote the phase-out of the use of mercury in certain products and processes where alternatives exist.

We recognize that there are major challenges at the country level for the fulfillment of the obligations and requirements of the Minamata Convention, such as shortcomings in the political and legislative frameworks to support the provisions of the Convention, lack of data on sources of release and emissions of mercury, the poor awareness of the health risks associated with mercury, among others.

The regional project (Initial Evaluation of the Minamata Convention - MIA), whose overall objective is to support Cabo Verde and Sao Tome and Principe in the conclusion of the pre-ratification activities under the Minamata Convention, helped fill these gaps, in order to help political and strategic decision-making to prioritize areas for future interventions.

This project has two great results:

1. Increased knowledge on the mercury issue and the Minamata Convention, as well as an environment for decision-making for ratification of the convention;

## 2. Development of a National Mercury Profile (NMP) and a Minamata Initial Assessment Report (MIA).

Cabo Verde relies heavily on marine resources in its diet. This increases the risk of exposure to mercury, particularly for long-lived marine species at the top of the food chain, such as tuna. FAO (2011) reported that fish consumption per capita for Cabo Verde was estimated at 12.2 kg per year and the primary catch species were tunas, lobsters and cephalopods. Fishermen and people who depend heavily on subsistence fishing are at increased risk of exposure to mercury.

Another important source of exposure to mercury in Cabo Verde is the burning of solid waste in landfills and/or hospital incinerators. It is estimated that 39,499 tons of total solid waste collected annually are burnt in the open in different municipal waste bins. It is also estimated that in this process about 197 kg of mercury is being burned. Much of the burning occurs close to urban areas, affecting a large number of people, with aggravation for the most vulnerable as those responsible for burning and people residing nearer and in the wind direction of the burning sites. At the same time, health professionals such as dentists and dental hygienists, as well as workers in certain industries where the heavy metal is used, are considered to be vulnerable.

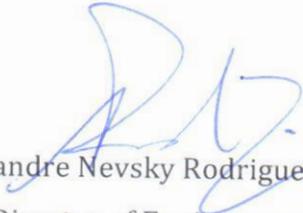
This report, by providing relevant information on gaps in the implementation of the Convention, the sources of mercury emissions, the management of this heavy metal at the national level and the most vulnerable population, intends to contribute to the analysis of opportunities and challenges in relation to the ratification and implementation of the Convention of Minamata, both for top decision-makers, the private sector and civil society in general.

Thinking about the people most vulnerable to mercury exposure, but also aware that global problems require global solutions, although with local actions, we thank everyone who contributed to the implementation of this report, with particular

focus on UNIDO, the Biodiversity Research Institute (BRI), the National Coordinator of the Project and the national and international consultants as well as the Global Environment Facility of providing financial support.

I am convinced that the present Report with the presentation of important facts about mercury in Cabo Verde will help the Government in ratifying the Minamata Convention.

Cabo Verde is committed to reduce or eliminate anthropogenic releases and emissions of mercury in the country, thereby contributing to reducing the threat to the environment and health of tens of millions of people.

  
Alexandre Nevsky Rodrigues  
National Director of Environment

## **Executive Summary**

The Minamata Convention on Mercury is a global treaty that aims to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds to the environment. Mercury is a naturally occurring element and although various natural processes contribute to the release of mercury, the anthropogenic causes are the source of greatest concern. As mercury enters the environment, it persists and cycles through ecosystems. The World Health Organization lists mercury as one of the top ten (10) chemicals of major public health concern as it is toxic to both humans and animals.

The Minamata Convention on Mercury aims to implement measures to reduce the emissions and releases of mercury from products and processes, phase-out the use of mercury-added products and provide environmentally sound management of the storage and disposal of mercury waste. Cabo Verde supports the objective of the Minamata Convention to protect human health and the environment from the effects of mercury and; now that the Minamata Initial Assessment is complete, Cabo Verde is taking steps to ratify the Convention.

Under the MIA Project, a national inventory of the major sources of mercury releases and emissions was conducted using the "Toolkit for Identification and Quantification of Mercury Releases" (Toolkit), made available by the Chemicals Branch of the United Nations Environment (formerly United Nations Environment Programme). This project used the Level 1 Toolkit to determine a comprehensive assessment of mercury inputs and their subsequent emissions and releases (in this report the term "releases" is used to cover mercury emissions to air as well as releases to water, land and other output pathways). The methodology is based on mass balances for each mercury release source sub-category and so, estimations provided by the Toolkit have various uncertainties and complexities involved.

For Cabo Verde, the inventory primarily used 2016 data obtained through research, interviews and stakeholder questionnaires. However, for some sub-categories, data from 2016 was not available and therefore previous years or default calculations were used to develop estimates. Default calculations were based on the Toolkit assumptions and may have resulted in over- or under- estimations of the actual mercury input. Data gaps were also noted for some sub-categories where no estimations could be made such as the use and disposal of polyurethane products with mercury catalysts, cosmetics containing mercury, laboratory chemicals and equipment, miscellaneous mercury-added products, and informal waste burning. The completed inventory Toolkit spreadsheet; a listing of national project stakeholders; and templates of questionnaires used for data collection, are included as Annexes to this document.

## **RESULTS OF THE NATIONAL MERCURY INVENTORY IN CABO VERDE**

Utilizing the data received with the Toolkit spreadsheet calculations, the total estimated mercury releases in Cabo Verde was 370 kilograms of mercury per year (kg Hg/y) and the top three sectors for mercury releases were:

1. Consumer Products with Intentional Use of Mercury (whole life cycle)
2. Waste Deposition
3. Waste Incineration and Open Waste Burning

The major contributing source categories for mercury releases are highlighted in Figure 1 and the releases estimated to various output pathways are summarized in Figure 2. Consumer products with intentional use of mercury was determined to be the most significant initial source category, accounting for 64% (235 kg Hg/y) of total mercury releases estimated. The sector also contributed to the largest mercury outputs to general waste (197.5 kg Hg/y).

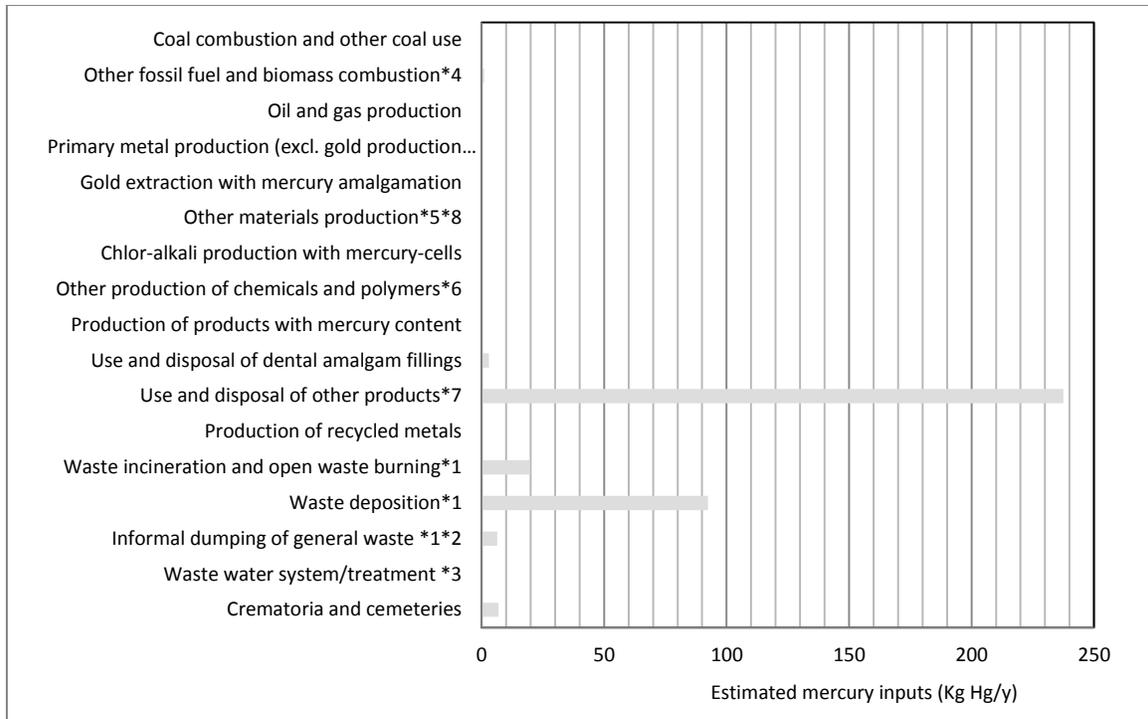


Figure 1: Estimations of total releases from the major sources of mercury identified in the mercury inventory conducted using primarily 2016 data for Cabo Verde.

The second highest source of mercury releases was found to be waste deposition at 924.4 kg Hg/y (realizing that only 10% of this waste is calculated in the total) and the third highest source was waste incineration and burning at 197.5 kg Hg/y). This was mainly attributed to estimations for mercury released from the informal burning of waste. Mercury is present in waste due to the disposal of mercury added products, and the burning of waste at landfills by the informal sector.

In terms of mercury or mercury compound stocks, it was determined that no significant stockpiles (exceeding 10 metric tons per year) are present in Cabo Verde.

Source category	Estimated Hg input, Kg Hg/y	Estimated Hg releases, standard estimates, Kg Hg/y							Percent of total releases *3*4
		Air	Water	Land	By-products and impurities	General waste	Sector specific waste treatment /disposal	Total releases *3*4*5	
Coal combustion and other coal use	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Other fossil fuel and biomass combustion	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1	0%
Oil and gas production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Primary metal production (excl. gold production by amalgamation)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Gold extraction with mercury amalgamation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Other materials production*6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Chlor-alkali production with mercury-cells	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Other production of chemicals and polymers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Production of products with mercury content*1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Application, use and disposal of dental amalgam fillings	3.0	0.1	1.3	0.2	0.2	0.6	0.6	3	1%
Use and disposal of other products	235	9.7	19.3	5.0	0.0	197.5	6.0	238	51%
Production of recycled metals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Waste incineration and open waste burning*2	197.5	197.5	0.0	0.0	0.0	0.0	0.0	198	42%
Waste deposition*2	924.4	9.2	0.1	0.0	-	-	-	9	2%
Informal dumping of general waste *2*3	63.1	6.3	6.3	50.5	-	-	-	13	3%
Waste water system/treatment *4	40.4	0.0	36.4	0.0	0.0	4.0	0.0	4	1%
Crematoria and cemeteries	6.9	0.0	0.0	0.0	0.0	0.0	0.0	7	1%
<b>TOTALS (rounded) *1*2*3*4*5*6</b>	<b>370</b>	<b>220</b>	<b>30</b>	<b>10</b>	<b>0</b>	<b>200</b>	<b>10</b>	<b>470</b>	<b>100%</b>

Figure 2<sup>1</sup>: Estimations of releases to each output pathway from the major sources of mercury identified in the mercury inventory conducted using 2016 data

<sup>1</sup> Totals presented in Figure 2 show the full estimations for mercury releases due to waste deposition and waste water treatment. When determining mercury releases from sectors as shown in Figure 1, only a percentage of these estimations were used in order to avoid double-counting.

## **STRATEGIES FOR IDENTIFICATION OF CONTAMINATED SITES AND ASSESSMENT OF RISKS TO HUMAN HEALTH**

In terms of contaminated sites, the Minamata Convention has no mandatory obligations, but the development of strategies for identifying and assessing sites contaminated by mercury or mercury compounds is recommended. This was initiated under the MIA Project.

Exposure to elemental mercury and mercury compounds can pose a higher risk to certain populations that are more sensitive to its effects or have an increased frequency of exposure. In Cabo Verde, these groups include pregnant women and women of childbearing age, the fetus, newborns and young children, individuals with health-related preconditions, populations with a regular diet of contaminated high trophic level aquatic organisms, individuals who consistently use mercury-added products such as skin-lightening creams with mercury, people living in areas that are more susceptible to environmental contamination by mercury such as locations surrounding the main landfills and other disposal sites; and workers regularly exposed to mercury.

Skin-lightening creams are generally more popular among women than men, and the risk of using products containing mercury is therefore likely to be higher in the female population. Based on the lack of preliminary information gathered, a more in-depth study of the gender ratios for these professions would be required to accurately confirm and quantify patterns of exposure and at-risk populations, according to gender and occupation type.

## **MAJOR FINDINGS OF THE POLICY, REGULATORY AND INSTITUTIONAL ASSESSMENTS**

As part of the legislative gap analysis, the gaps between the Convention and national laws in Cabo Verde were examined. During the course of this review, the following conclusions were reached:

1. Within the context of Cabo Verde, some parts of the Convention are not immediately relevant to Cabo Verde and therefore do not need to be part of the countries priorities in addressing legal gaps. These include: supply/mining of mercury (among numerous items listed under Article 3); manufacturing processes that use mercury or mercury compounds (Article 5); ASGM (Article 7); and, most of the activities listed in Annex D (Point source emissions).
2. The life cycle management of mercury-added products (MAPs) presents a challenge in Cabo Verde. Cabo Verde is a net importer of MAPs, thus Articles 4, 10, and 11 are important obligations that will need to be addressed. There are a broad set of regulating authorities in Cabo Verde with competency regarding MAPs (namely in the field of biocides, pesticides, cosmetics, public health, water, and waste management). These institutions have experience in working together and have established committees dedicated to chemicals management. However, existing regulations will need to be bolstered to address the obligations of the Convention.
3. Overall, the review of legislation revealed that only a limited number of laws in Cabo Verde specifically address mercury and mercury-added products, with exception of regulations for cosmetics and fish consumption guidelines. However, a broad scope of laws and regulations exist in Cabo Verde that can provide the basic framework for the insertion of specific provisions to address the obligations of the Minamata Convention, notably:

- **Basic Environment Law** which aims to promote overall environmental quality and sets general principles for protecting the quality of the air, water, flora, fauna, soil, and subsoil. It includes provisions that regulate the prevention of pollution derived from chemicals and sets forth the need for regular evaluation of the potential effects of chemicals on humans and the environment, control on the production and use and disposal of chemicals, and the promotion of information to the public. It also commands the Government to legislate on maximum limits for pollution by heavy metals.
- **Water and Sanitation Code** includes a section that sets general provisions that cover water quality including drinking water, water for agricultural purposes, waste water and bathing water. Water for agriculture purposes and waste water will need to be further regulated as part of the ratification process. In addition, the **Strategic Plan for Waste Management (PENGER)** provides for the following: construction of environmentally sound infrastructures at the state and municipal levels, the management of specific waste flows, and an integrated system for waste management. PENGER provides the masterplan for waste management in Cabo Verde but will need to be updated to address mercury.
- **Decree-Law n. 5.2003** establishes a National Air Quality and Monitoring Systems but will need further bolstering to meet the obligations of Article 8.
- Additionally, legislation is being drafted to address biocides, waste management facilities, and to establish a National List of Hazardous Products that is aimed at allowing for better waste management through standardization of classification of solid waste.

4. Cabo Verde is a small country with a structured regulatory framework in place. The country is a Party to the Basel, Rotterdam and Stockholm Conventions and the regulations already in place for these Conventions will prove to be an advantage for the implementation of the Minamata Convention.
5. The legal analysis identified the following gaps and challenges in order for Cabo Verde to comply with the Convention obligations:
  - Cabo Verde has not ratified the Convention but is taking steps toward ratification, namely by conducting a Minamata Initial Assessment to determine the extent and sources of mercury pollution in the country. The completion of the Minamata Initial Assessment in Cabo Verde helped quantify the key sources of mercury in the country and will help to set national priorities to meet the obligations of the Convention.
  - As a net importer of MAPs, Cabo Verde needs to strengthen its current laws in this area.
  - A leading institution for the implementation of the Minamata Convention will need to be identified.
  - The lack of specific provisions and existing regulations pertaining to mercury and thereby low awareness by the key stakeholders and the population about the need to regulate mercury will need to be addressed.
  - Regulations covering solid waste do not currently include mercury waste storage and disposal.

- Dental amalgam is still allowed on the legislation for dental restoration subsidies (Ordinance n.º 34/2006 as of 18 December 2006).

With regard to the above, some actions and next steps are recommended:

- To facilitate activities relating to mercury, a national coordinating entity should be identified through a legal instrument such as a joint Ordinance by relevant Ministries to start preparing for the ratification of the Convention.
- A National Plan for the implementation of the provisions of the Minamata Convention is strongly recommended.
- Article 4 (MAPs): As a net importer of MAPs, Cabo Verde needs to bolster and add new legislation for MAPs, incorporating the applicable mandated phase outs and addressing legislation on non-electronic measuring devices. The draft legislation on biocides needs to be updated to include mercury and thresholds need to be established for monitoring mercury in fertilizers and pesticides. In the new MAP legislation, Cabo Verde will need to elaborate on dental amalgam phase down measures as a minimum requirement of the convention. A specific provision banning the use of dental amalgams is recommended as it is still allowed in existing regulation and subsidized along with other mercury-free dental restoration techniques.
- In order to ensure an integrated approach to activities related to MAPs, a Legal Planning and Political Directive should be developed to harmonize all relevant legislation and the responsibilities of relevant institutions concerning the use and disposal of mercury added products.

- Article 5 (Manufacturing Process): It is worth recommending that even with the absence of industries or processes that use mercury, Cabo Verde can take a preventative measure by including legislation or rules that prohibit these mercury processes or industries from taking root in Cabo Verde. Further, it would be prudent for Cabo Verde to ratify the Basel Ban Amendment which prohibits developed countries from exporting their toxic wastes, including mercury wastes, to Cabo Verde, whether for disposal or recycling. The Basel Ban Amendment creates another layer of protection against toxic waste dumping and places the onus on developed countries to monitor and prevent toxic waste exports to Cabo Verde.
- Article 8 (Emissions) - Cabo Verde will need to determine a path forward for controlling mercury emissions within the parameters of the Convention. It would be prudent to set limits in order to measure mercury and monitor emissions from existing incineration facilities such as hospitals.
- Article 9 (Releases): It will be prudent for Cabo Verde to further specify its approach to releases under the Convention. Reflection should be made by the authorities regarding the need to issue legislation regarding procedures for regular mercury monitoring.
- Article 10 (Storage): Cabo Verdean authorities should monitor the Minamata Convention efforts in developing environmentally sound storage guidance, especially concerning MAPs.
- Article 11 (Mercury Wastes): No legal provisions currently addresses the environmentally sound management of mercury waste. A National Implementation Plan is recommended and should include methods for mercury waste management. Laws concerning disposal and management

of waste derived from MAP (notably lamps and non-electronic devices) are strongly recommended. Legislation should ensure compliance with the Basel Convention Technical Guidelines for the ESM waste consisting of, containing, or contaminated with mercury or mercury compounds.

Another important area for implementation of the Minamata Convention is the need for institutional strengthening. The implementation process would involve the need for a sound and proactive communication plan, and a carefully designed governance and accountability action plan.

The Ministry of Agriculture and Environment, through the National Directorate of the Environment, is the Focal Point for Multilateral Environmental Agreements (MEAs) and issues related to the environment and would therefore be responsible for the coordination and implementation of the Minamata Convention. This would have to be done in collaboration and cooperation with other designated agencies that have specific responsibility for various areas involved in the implementation of the Minamata Convention. A steering committee made up of representatives from key organizations should therefore be formed. A National Steering Group was formed under the MIA Project and can be continued post-project with leadership by the Ministry.

#### **PRIORITY AREAS FOR CONSIDERATION IN THE IMPLEMENTATION OF THE MINAMATA CONVENTION**

In addition to the legislative and regulatory recommendations for consideration in the implementation of the Minamata Convention, other practical considerations may include:

- Promotion of mercury-free alternative consumer products (which are already widespread on the market). For example, the use of Light Emitting Diodes (LEDs) may be encouraged instead of mercury-containing compact fluorescent lightbulbs (CFLs). Public awareness on the hazards of mercury

and the benefits of using mercury-free alternatives should be enhanced to encourage a higher substitution rate.

- Development of proper separation methods for the disposal of mercury-added products both at the household consumer level and in the landfill management procedures. The Government should ensure that the public has access to environmentally sound facilities/locations that could aid in the disposal process, as well as information and guidelines on disposing mercury-added products. A holistic approach for establishing suitable storage and disposal facilities in Cabo Verde to manage mercury waste as well as other hazardous wastes from all sectors would prove beneficial in the overall environmentally sound management of waste.

## **Introduction**

The Minamata Convention on Mercury, opened for signature in October of 2013, is a global treaty developed to protect human health and the environment from the adverse effects of mercury. The treaty seeks to address issues related to the use and release of mercury including trade, industrial uses, and major sources of atmospheric emissions and releases of mercury into the environment, as well as long-term storage and disposal of mercury and mercury compounds. In order to achieve this objective, signatory countries are charged with protecting human health and the environment from the risks of mercury exposure by systematically controlling mercury emissions and releases, including phasing out the use of mercury in certain products and processes.

Mercury (Hg) is a pollutant of global importance that adversely affects human health and the environment. Although mercury is naturally found in the environment, it is released primarily through human activities. Mercury is one of the best-studied toxins in relation to health and the environment, which is why it has long been considered a universal pollutant; however, there are some knowledge gaps in its life cycle, management, and release (UNEP Chemical Products, 2002). Environmental concentrations of mercury have increased three-fold due to human industrial activities, and the world's oceans are one of the primary reservoirs where mercury is deposited (Mason et al. 2012).

The overall objective of this Minamata Convention Initial Assessment (MIA) is to assist Cabo Verde in completing pre-ratification activities under the Minamata Convention in order to enable policy and strategic decision-making and to prioritize areas for future interventions. The Government of Cabo Verde has not signed the Convention but is taking steps towards ratification/accession which is expected to occur once the Minamata Initial Assessment is complete. Two major outcomes are expected from the undertaking of this effort:

1. Development of knowledge about the issue of mercury and the Minamata Convention as well as an environment for decision-making for the ratification of the convention; and,
2. Development of a National Mercury Profile (NMP) and a Minamata Initial Assessment (MIA) Report.

Cabo Verde and UNIDO designated Biodiversity Research Institute (BRI) to be the main executing agency of this project. The development of MIA, led by the Ministry of Agriculture and Environment (MAE) through the National Directorate of Environment, in partnership BRI and UNIDO, started in May 2016 and concluded in June of 2018. This effort was conducted using the Level 1 Inventory as presented in the "Toolkit for identification and quantification of mercury releases" made available by the Chemicals Branch of the United Nations Environment Programme (UN Environment Chemicals). Data for the year 2015/2016 have been used in the inventory, when available. This MIA for Cabo Verde contains a country profile, the results of the inventory of the sources and releases and emissions of mercury, findings of a policy, regulatory, and institutional framework analysis, an analysis of populations at risk and gender dimensions related to mercury, a review of worker and public awareness of mercury and opportunities for improving knowledge of mercury, and a brief overview of an approach for meeting the obligations of the Convention.

The implementation of this project provided the possibility of meeting various needs, such as collecting basic information on mercury levels in various media (air, water, sediments, and soils) and biota (wildlife and humans) and conducting a risk assessment for mercury contamination in humans and ecosystems. The inventory of mercury in the country will be a basic tool for intercommunication between the government, private and public sectors and the general public, which requires awareness of the possible harmful effects of mercury, proper management and waste management practices. The MIA should be combined with additional knowledge about identifying the sources of mercury and the options available to

reduce them economically.

A continuous and wide-ranging consultation process was conducted to support the implementation of this project. This inclusive consultation process is a key characteristic of the MIA due to the difficulties inherent in the collection of relevant information on mercury, which made necessary the involvement of relevant national stakeholders and institution. During the implementation of this project, the consultation process provided opportunity for stakeholders to contribute directly to the attainment of the goals of this project, by providing data for the inventory. It also allowed them to acquire some awareness on mercury issues and training (on the use of the toolkit for data collection for the inventory of mercury), which helped facilitate the whole process.

## **Chapter I: National Background Information**

### **COUNTRY PROFILE**

#### **Geography and population**

The Archipelago of Cabo Verde is an African state consisting of 10 islands and 13 islets, located 570 kilometers west from Senegal. The islands are of volcanic origin, relatively small sized, dispersed and are in an area of high meteorological aridity.

According to the International Maritime Organization (2013), Cabo Verde has about 512,096 inhabitants, mainly concentrated in urban areas (65%) in a proportion of 49.8% men to 50.2% women. The island of Santiago is the most populous, with about (57%) of the total inhabitants, followed by São Vicente (15%) and Santo Antão (9%), within a surface of 4,033 km<sup>2</sup>, resulting in an average population density of 127 hab / km<sup>2</sup> (2013).

With an average life expectancy of 74 years (72 years for men and 76 years for women), Cabo Verde ranks 123rd among 187 countries on the Human Development Index, entering the category of medium human development country in 2007. The average GDP per capita is approximately 3700 USD, which excluded Cabo Verde from the list of Least Developed Countries of the United Nations in December 2007.

Real GDP growth per capita averaged 7.1% between 2005 and 2008, well above the average for Sub-Saharan Africa and for Small Island States (World Bank, 2014). What is considered the primary sector, mainly agriculture and fishery, represents the poorest parts of Cabo Verde's population, due to the absence of adequate investment in technologies, equipment, and training, restricting the output to traditional crops and catches of fishes of low market prices and quantities only enough for local consumption. Cabo Verde's poorly developed industry contributes 8.7% of total Gross Value Added (GVA). Cabo Verde's economy is based on the tertiary sector (70% of GVA and almost 53% of the employed population) with

tourism being the fastest growing sector.

Economic growth is, for the time being, based on public demand and, in recent years, with some direct foreign direct investment (FDI) contribution. Traditionally, remittances from immigrants have a significant influence on the economy and especially on family incomes.

## **POLITICAL, LEGAL AND ECONOMIC PROFILE**

The Republic of Cabo Verde is a sovereign, unitary and democratic State, governed by internal laws that safeguard respect for human rights, peace and justice. In addition to its legal system, the State of Cabo Verde is also bound by international Conventions and Treaties on human rights and the sovereignty of its people.

The State of Cabo Verde is based on the principles of ideological freedom, political, social, cultural, religious and economic democracy, equality, justice and solidarity. Thus, it assumes itself as a state of law, democratic and secular.

The functioning of the State is governed by a republican and democratic model, which establishes as fundamental principles the unity of the State, the separation and interdependence of the sovereignty institutions, religious neutrality, independence of the courts, existence and autonomy of the local powers and decentralization of public administration.

Political power is exercised by the people through suffrage, referendum, and other constitutionally established forms. The President of the Republic is the supreme representative of the State and is elected by the people. The National Assembly is constituted based on the popular vote and it designates the Head of Government to be appointed by the President of the Republic.

Administratively, the country is divided into twenty-two municipalities, distributed across nine islands (Figure 3). The administration of each municipality is ensured

by the City Council (executive body) and by the Municipal Assembly (deliberative body). These two municipal bodies are elected by their respective populations.

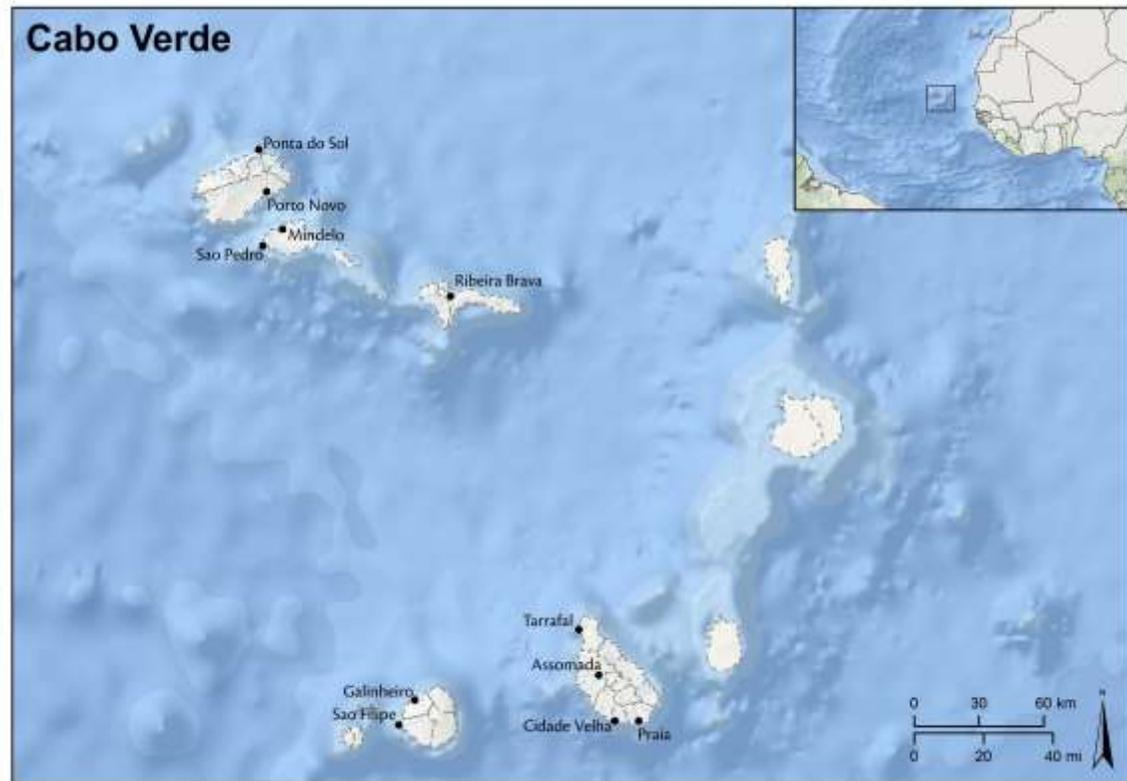


Figure 3. Cabo Verde.

The economy of Cabo Verde is fundamentally characterized by the existence of structural weaknesses; that is, the economy is largely dependent on external sources instead of production of natural resources. This structural weakness is due to an enormous scarcity of natural resources, weak market (great imbalance between the resources generated, the final consumption and the need to produce capital), great dependency on external donations and loans, and finally the emigrants' remittances. The main economic activities relate to the primary sector which still employs a significant percentage of the active labor force; the tertiary sector (trade in particular) is very dynamic and a major GDP contributor.

Cabo Verde's main social development problem is the persistence of poverty,

particularly among women, in a context of unbalanced spatial distribution, worsening in the urban environment, as a result of strong demographic pressure on available resources. Good governance, sound macroeconomic management, trade openness and greater integration into the global economy as well as the adoption of effective social development policies have sustained the development trajectory. In December 2007, Cabo Verde left the list of United Nations Countries Least Developed Countries and was upgraded to the group of Developing Countries.

Per Capita growth in real gross domestic product (GDP) averaged 7.1% between 2005 and 2008, yet the global financial crisis did not leave Cabo Verde unharmed. In 2009 the country experienced a recession and had a modest recovery registering real growth of 4% in 2011. GDP growth was estimated at 0.5% for 2013 and 1% for 2014.

The trade sector is characterized by strong dynamics of the private sector, formal and informal, in the purchase and resale of all types of goods, with special emphasis on food staples.

Agricultural production is highly unstable and deficient. The country produces only between 10 and 15 percent of the food it consumes, depending on commercial importation and food aid. Heavy goods and equipment and oil products are 100% imported. Services, which account for about 90% of exports, are concentrated in more than 70% of tourism and air transport.

*Table 1. - Characterization of the contribution of economic sectors to GDP - Data for 2015*

<b>Sectors</b>	<b>Contribution (%)</b>
Agriculture, Silviculture, Livestock and Fisheries	8,5
Manufacturing, Energy and Construction	16,2

Services	75,3
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*Source: Growth and Poverty Reduction Strategy Paper*

## **PROFILES OF ECONOMIC SECTORS**

Mercury pollution into the environment is largely associated with industrial activities. However, the industrial activity in Cabo Verde is still very poor. These industries, with the exception of producers of soft drinks and beers, paint manufacturing and ship repair, contribute negligibly to the emission to the atmosphere and releases to soil and water. On the other hand, industries and the use of fertilizers and pesticides are the main responsible for chemical soil contamination. The most at risk regions are urban areas, the immediate vicinity of industrial facilities, intensive farming areas, ports, fuel storage facilities and car service stations (including repair shops).

The main route of soil contamination in the non-agricultural areas is the dumping of wastes without proper treatment despite waste management being a national concern. Annually, the country produces approximately one hundred tons of waste. The waste produced, mostly household wastes generated in urban areas, are usually contaminated by industrial or hospital refuse. Contaminants contained in these wastes include: plastic materials and tires, corrosive products, metals, heavy oils and detergents, among others. Among hospital wastes, although in small amount, it is possible to find old thermometers and other materials containing mercury. Out of all these wastes produced, only a small proportion is recycled or exported including plastics, scrap metals and used oils.

The fact that Cabo Verde is located in the Sahelian region makes its agricultural potential weak due to water scarcity which affects the development of irrigated agriculture. The Exclusive Economic Zone of Cabo Verde, which encompasses the surrounding ocean, totals 734.265 Km<sup>2</sup>. According to the Food and Agriculture Organization (FAO-UN) the potentially available resources of this zone is in the

order of 26 to 33.000 tons / year. This is largely attributed to tuna, a migratory species that represents an approximate potential of 25.000 tons of annual catch. Commercial and recreational fishing has contributed significantly to the economic development of the country, which justifies its classification as one of the strategic axes for the future.

In recent years, another sector that has experienced strong growth is tourism, with, with the number of tourists increasing from 13,286 in 2000 to 241,742 in 2006. In the face of a growing demand from the external market, the tourism sector has been pushing large projects, especially in the construction sector, which, as a result, has put pressure on the environmental sector. In the road transport sector, there has been a considerable increase in the number of vehicles in circulation. According to data from the General Directorate of Road Transport, 50,734 vehicles were circulating in Cabo Verde until December 2011, compared with 24,077 vehicles in 2001.

Recent inventories of releases of mercury from various sectors has demonstrates a reduction, with the exception of batteries and medical uses.

## **ENVIRONMENTAL OVERVIEW**

The geography of Cabo Verde influences the behavior of its environmental variables. Being located in a region strongly influenced by the Sahara Desert, the archipelago presents an arid climate with limited precipitation distributed across both space and time. The average annual rainfall does not exceed 300 mm (millimeters). When exposed to the trade winds, the precipitation can be greater than 700 mm. These climatic factors have repercussions on agriculture productivity, as well as drinking water supplies and demographic distribution. These factors are the basis of development imbalances between different regions of the country.

As an Island State of volcanic origin, the soils present a varied composition,

emphasizing basaltic forms, phonoliths, slag, tufts, andesites, trachytes and sedimentary rocks, mainly limestone. The soil is mostly skeletal and poor in organic matter. However, in each of the islands, there are soils rich in humus and favorable to the practice of agriculture.

Due to the human activities and use, it is estimated that soil loss per year is around 7.8t / ha (hectares) under traditional agriculture (corn and beans). To aggravate the scenario, the soils are subject to strong water and wind erosion, as well as intense exploitation for the construction sector.

Remediation measures include reforestation, the construction of terraces, dikes and other forms of physical protection. Thus, more than 32.2 million plant specimens have been planted and thousands of kilometers of anti-erosive infrastructure have been built in the last decades. In addition, legislative measures have been adopted to regulate the use and exploitation of soils.

Industries that use of fertilizers and pesticides are mostly responsible for soil contamination from chemicals. The most at risk regions include urban areas, the immediate vicinity of industrial facilities, intensive farming areas, ports, fuel storage facilities and car service stations (including repair shops). The main route of soil contamination in the non-agricultural regions is the dumping of waste without proper treatment. Contaminants contained in these wastes include: plastic materials and tires, corrosive products, metals, heavy oils and detergents, among others.

Water resources are one of the limiting factors of the country's economic growth due to its low availability. The water deficit has significantly limited development of activities linked to agriculture and livestock farming, creating serious obstacles to water access for many sections of the population, including the rural population.

In Cabo Verde, air quality is determined mainly by atmospheric conditions derived from the winds coming from the Sahara region, in addition to the contribution of sea

breeze. However, anthropogenic influences deserve attention given the diversity and intensity of activities potentially polluting the atmospheric environment, particularly in the field of road transport.

Natural pollution from dust from the Sahara has been increasing in intensity and duration in recent years. In the 1980s, this phenomenon was confined to the months of December and January, but since the 1990s, there has been a gradual extension and worsening of the situation with pollution from dust extending until the middle of March each year, affecting the maritime and air navigation as well as the public health.

The main anthropogenic sources of air pollution in Cabo Verde appear to be fossil fuel combustion, predominantly in the transport sector, and the open-air waste burning in areas of high human concentration, especially in urban centers. However, activities related to the construction sector, namely the stone quarry crushing industry and the use of cement, cannot be ignored.

Petroleum based fuels are important in assessing air quality in Cabo Verde, given the rapid growth in the transport sector, particularly the car sector, and increasing energy demand driven by growth. Fossil fuels accounted for 65% and wood fuel emissions accounted for 35% of total atmospheric emissions. Wood fuel and biomass consumption accounted for 98% of methane emissions, while fossil fuels accounted for 67% of nitrogen oxides emissions.

In terms of priorities, Cabo Verde has no policy that specifically addresses mercury, However, there are national priorities, such as sustainable development, biodiversity conservation, agricultural development, food security, etc. under which a policy can be developed. For instance, the National Action Plan for Environment, named PANA, is a comprehensive and multidisciplinary strategic document that reflects the strong interrelation among various sectors including environmental, economic, social and political sectors and their direct and indirect implication in the

fragile natural ecosystem of Cabo Verde as a Small Island State in Development. PANA provided the country with a strategy that promotes the rational use of natural resources and the sustainable management of economic activities. The main objectives of PANA include the sustainable management of the environment and natural resources, the definition and strengthening of institutional framework and mechanisms for intersectoral coordination, and the promotion of the integration of environmental concerns into socio-economic development planning.

## **Chapter II: Mercury Inventory and Identification of Emissions and Resources**

### **DATA GAPS (INVENTORY METHODOLOGY AND LIMITATIONS)**

The greatest challenges were encountered by identifying and obtaining the data and information necessary to complete Step 6 of the inventory relating to mercury containing products and substances. The Customs authorities, as well as other relevant institutions, were very helpful in providing insight in the number of mercury containing products that were on the market.

The Harmonized System Codes (HS) for various light sources alone were not sufficient to provide a final estimate on the number of mercury containing light sources. In hindsight, emissions from these sources seemed to be elevated. One improvement within the Level 1 inventory could be an assessment among distributors and importers on the number of mercury lamps imported each year, their origin and an indication of the range of mercury content. Another approach could also be the use of a Level 2 inventory.

Lastly, the estimated mercury input for (1) open waste burning and (2) informal dumping of general waste can be greatly improved with more thorough field surveys.

### **MAIN PRIORITIES FOR FURTHER ASSESSEMENT**

The estimated values for Use and Disposal of Other Products are the highest source category of mercury in Cabo Verde (not including waste). It is therefore of the utmost importance that the data presented in Step 6, Mercury Products and Substances, of the Level 1 inventory accurately reflects the current situation. Inventory efforts should have a particular focus on mercury containing thermometers and sphygmomanometers, mercury containing batteries, and light sources with mercury. Import data are often unclear for certain mercury containing products (e.g. sphygmomanometers), groups products and items by HS code. For example, these HS codes do not distinguish between compact fluorescent lamps (CFL) and fluorescent tubes (which have a different mercury content).

In addition, the mercury content in energy efficient lamps can also dramatically vary by brands. Therefore, import data needs to be compared and cross checked with information and data obtained through other sources (e.g. importers/distributors; conducting assessments/survey among users, etc.), to a clear and accurate picture of the current situation. Such efforts to collect additional data could be carried out as part of a Level 2 inventory.

Other areas of further research could be related to electrical switches. Detailed information in this area (real vs estimate number) could potentially be provided by the whole industry sector, mechanics or automobile electricians.

The public dental institutions still use dental mercury amalgam. No specific waste management practices for mercury containing waste streams are being promoted or have been put in place. It would be important to determine the amount of dental amalgam being imported on an annual basis and to obtain a sense of the use of alternative filling versus amalgam fillings. Furthermore, early action could be promoted towards the phase-out of the use of dental amalgams, while improving waste management practices of amalgam-containing waste to minimize releases to the environment.

An aggregated presentation of the results for main groups of mercury release sources is presented in Figures 1 - 7 and Table 1 below.

Figure 2: Estimated mercury inputs (Kg Hg/y) for Cabo Verde.

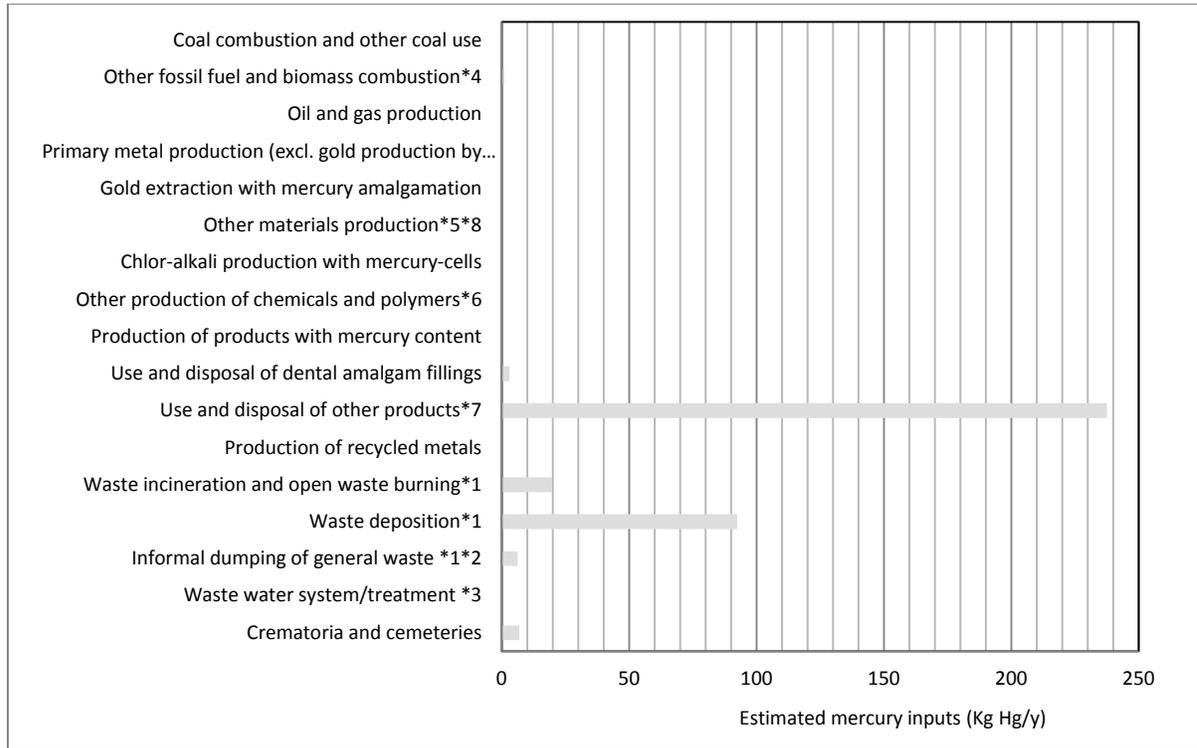


Figure 3: Estimated mercury releases to air (Kg Hg/y).

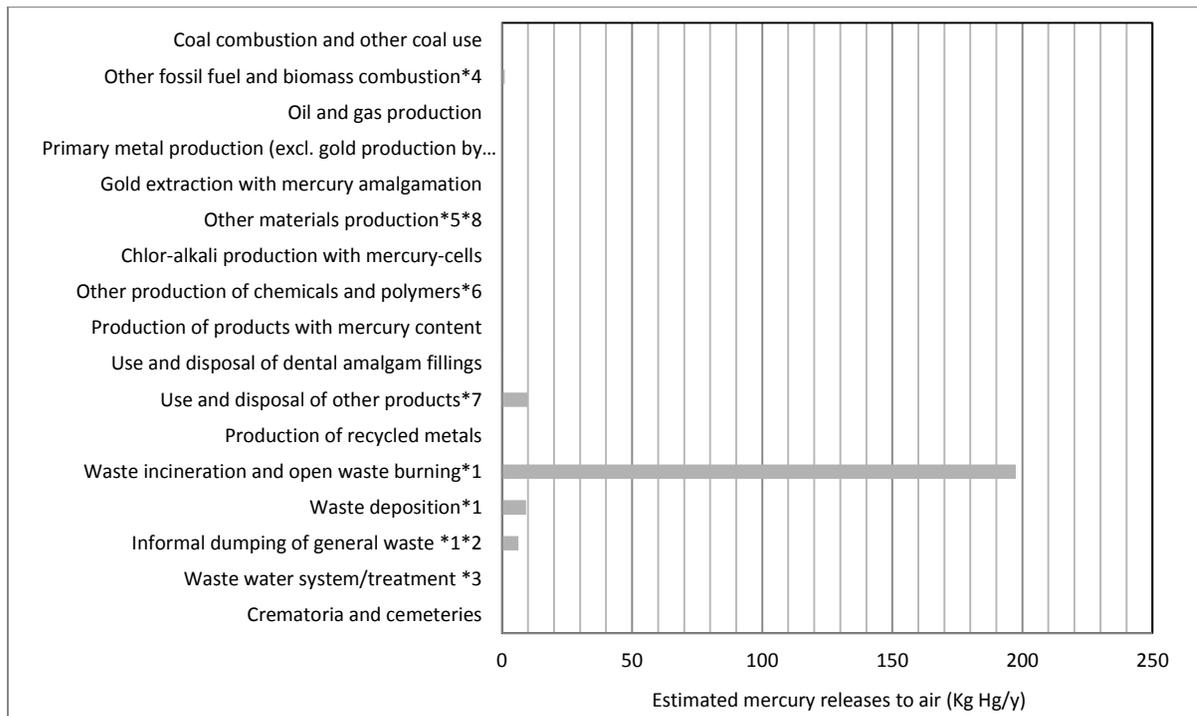


Figure 4: *Estimated mercury releases to water (Kg Hg/y).*

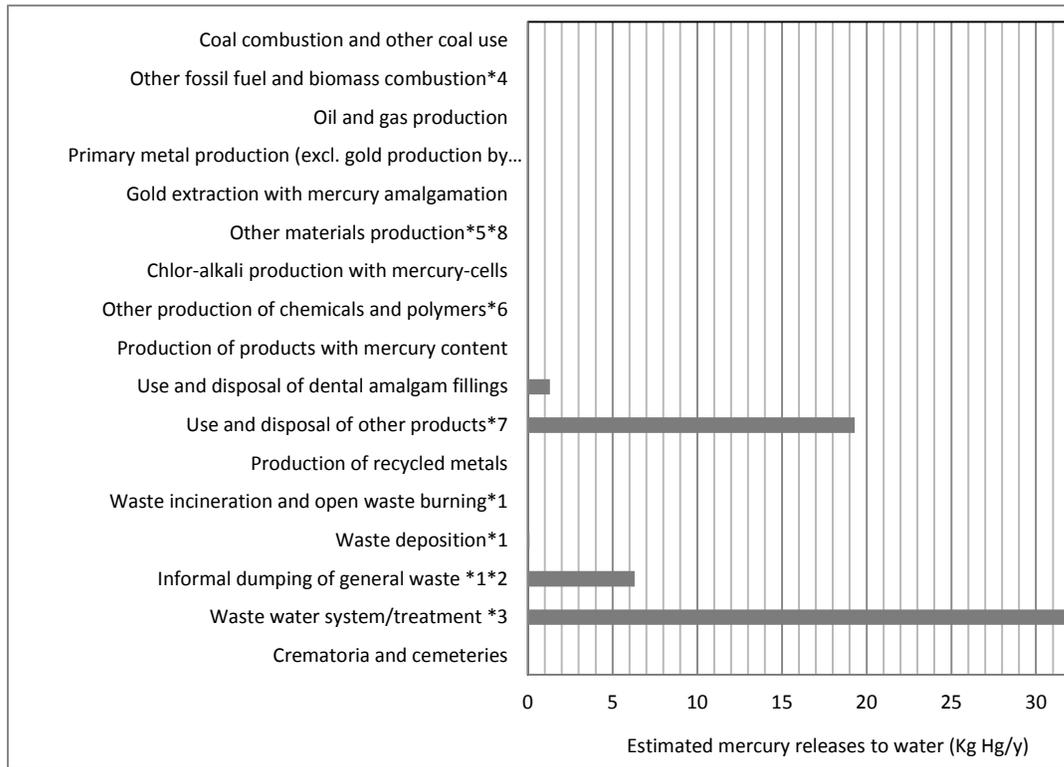


Figure 5: *Estimated mercury releases to land (Kg Hg/y).*

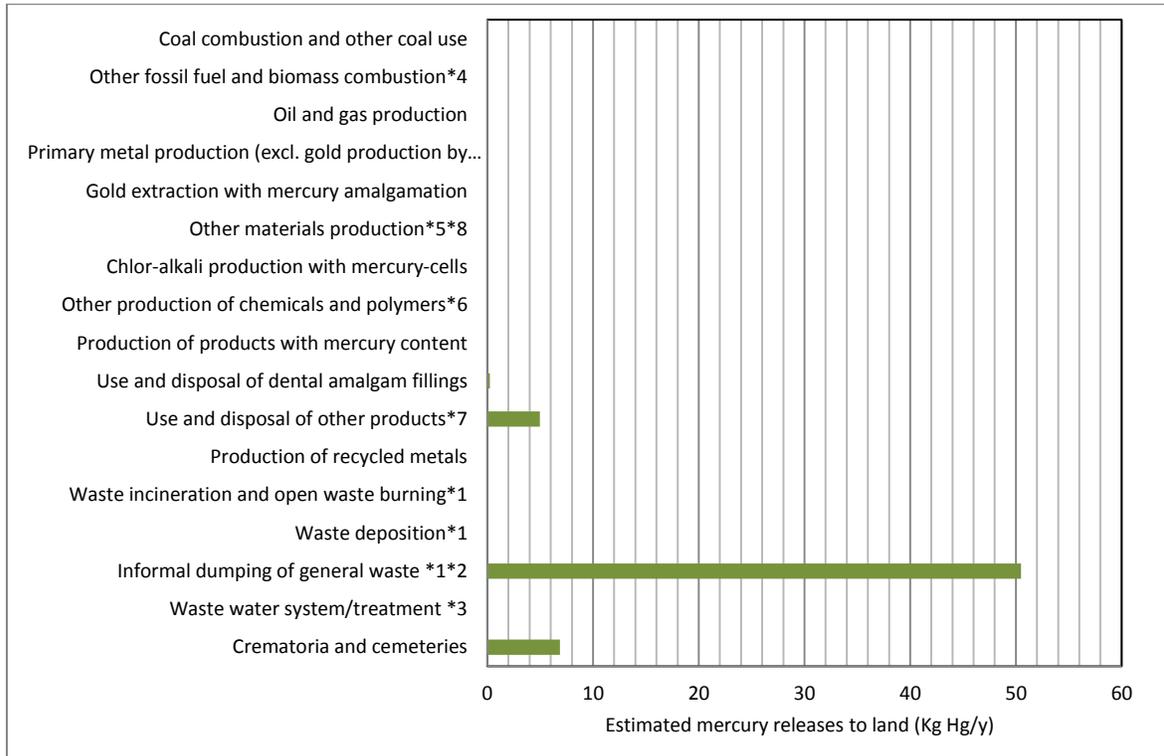


Figure 6: Estimated mercury outputs to by-products and impurities (Kg Hg/y).

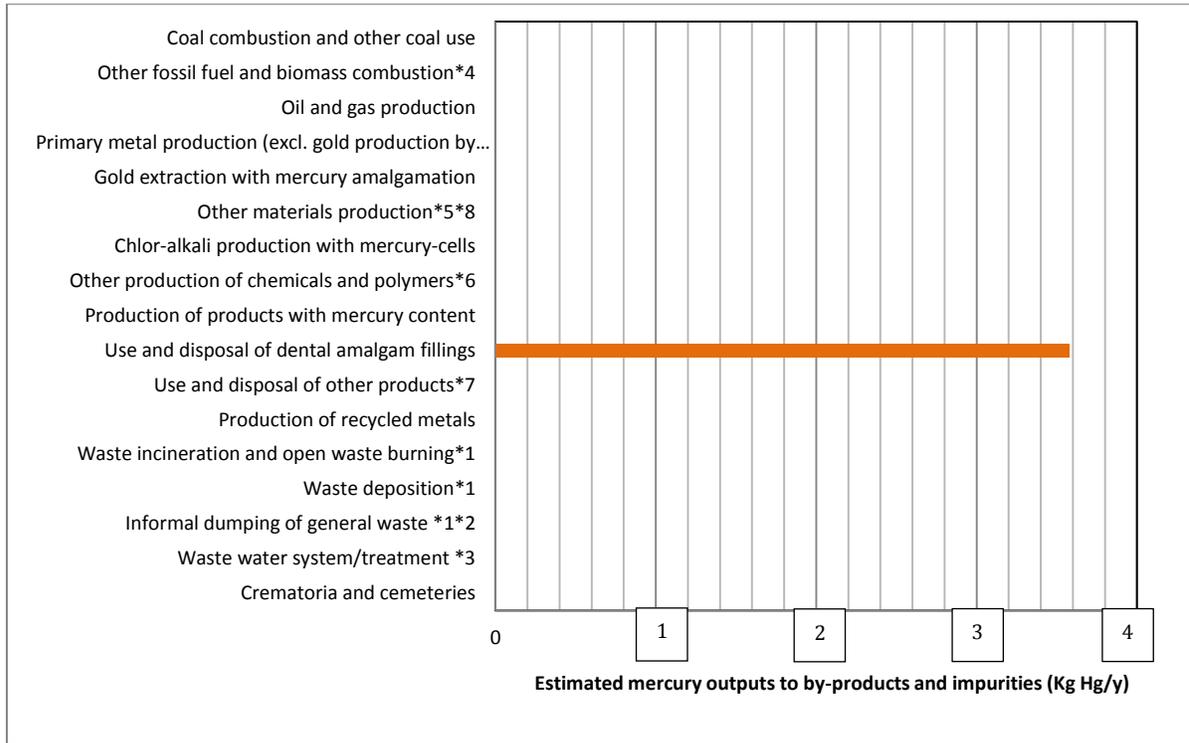


Figure 7: Estimated mercury releases to waste (Kg Hg/y).

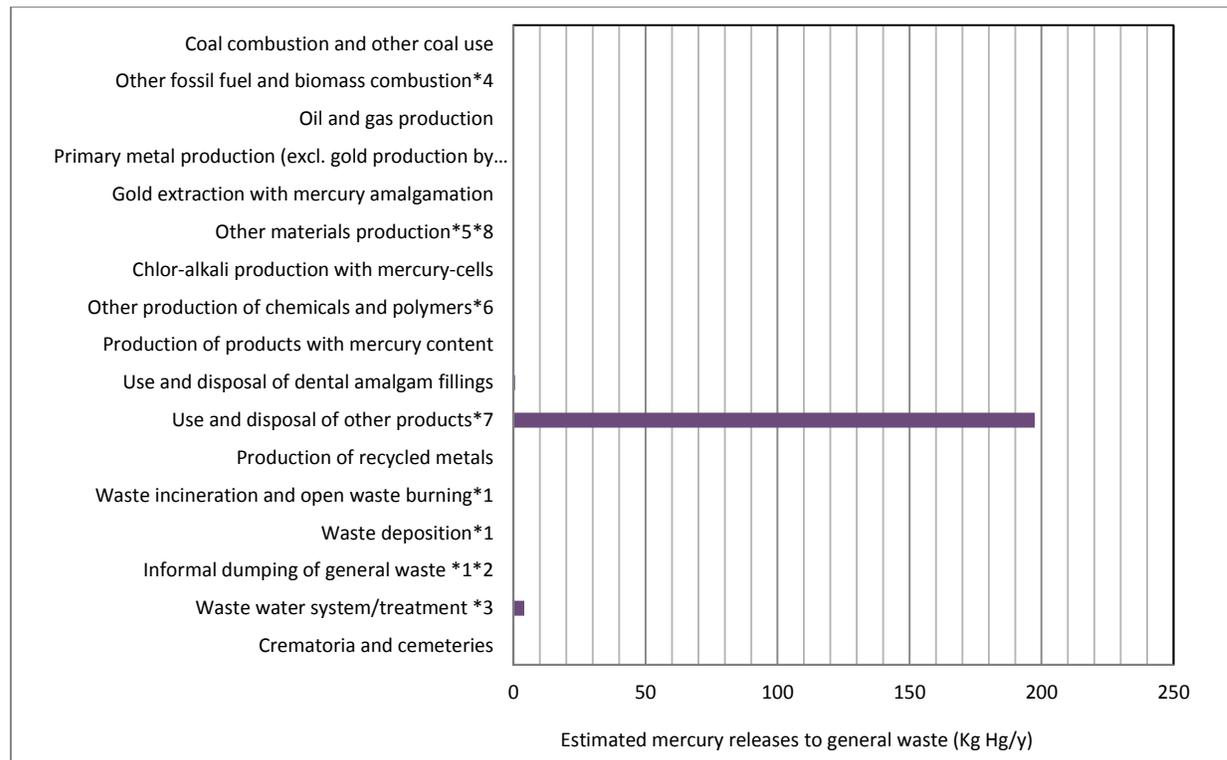
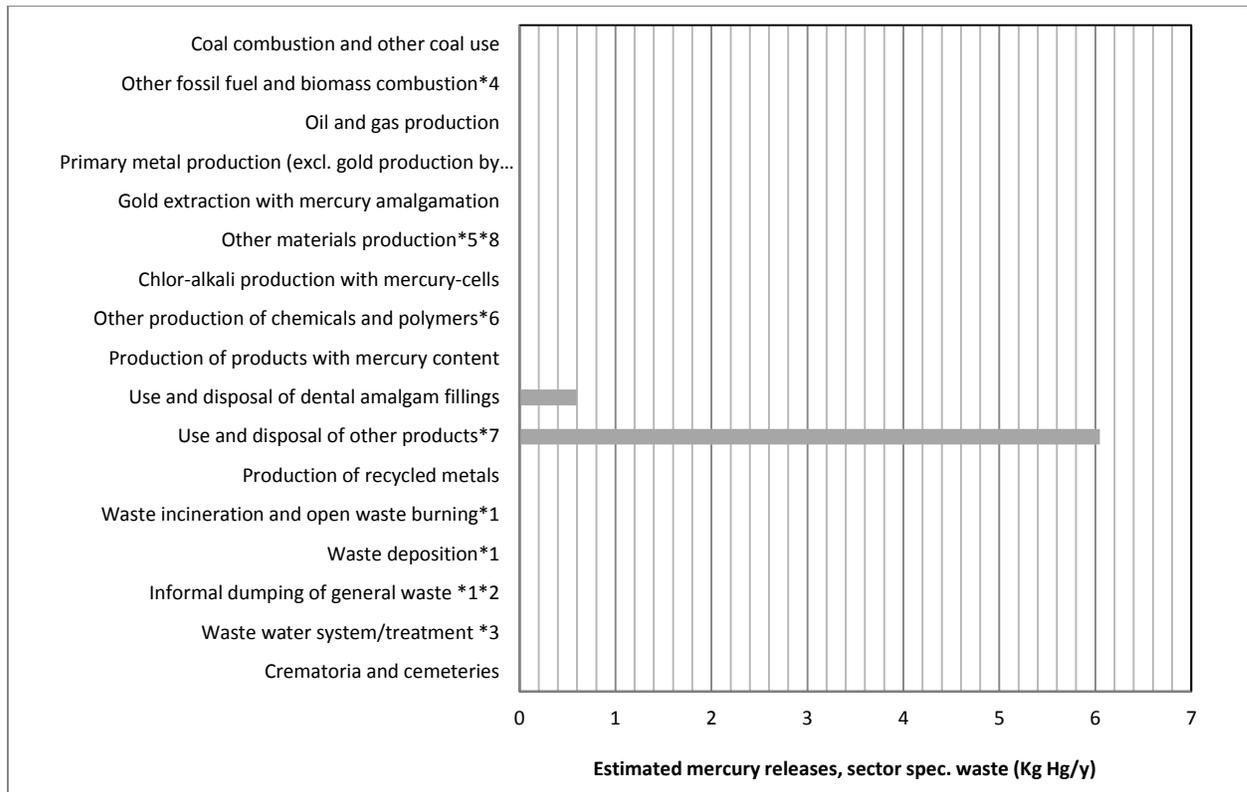


Figure 8: Estimated mercury releases, sector specific waste (Kg Hg/y).



**Notes to table above:** \*1: Waste is not an original source to mercury input to society. To avoid double counting of mercury inputs from waste and products in the graphs, only 10% of the mercury input to waste incineration, waste deposition and informal dumping is included in the chart for mercury inputs. These 10% represent approximately the mercury input to waste from materials, which were not quantified individually in Inventory Level 1 of this Toolkit. See Appendix 1 to the Inventory Level 1 Guideline for more explanation. \*2: Waste is not an original source to mercury input to society. The estimated quantities include mercury in products, which has also been accounted for under each product category. To signal the importance of this release pathway, the release to land from informal dumping of general waste has NOT been subtracted in the charts. \*3: Wastewater is not an original source to mercury input to society. The estimated input and release to water include mercury amounts which have also been accounted for under each source category. To avoid double counting, input to waste water system/treatment has been subtracted automatically in the charts. To signal the importance of this release pathway, releases to water via waste water system/treatment has NOT been adjusted in the charts in spite of double counting. \*4: Includes petroleum coke, heavy oil, diesel, gasoil, petroleum, kerosene, natural gas, charcoal, and other bio-fuels. \*5: Includes production of cement and pulp and paper. \*6: Includes production of VCM and acetaldehyde. \*7: Includes thermometers, electrical switches and relays, light sources, batteries, polyurethane with mercury catalyst, paints and skin creams with mercury, blood pressure gauges and other manometers, lab chemicals, and other lab and medical uses.

Table 1: Summary of mercury inventory results

Source category	Estimated Hg input, Kg Hg/y	Estimated Hg releases, standard estimates, Kg Hg/y							Percent of total releases *3*4
		Air	Water	Land	By-products and impurities	General waste	Sector specific waste treatment /disposal	Total releases *3*4*5	
Coal combustion and other coal use	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Other fossil fuel and biomass combustion	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1	0%
Oil and gas production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Primary metal production (excl. gold production by amalgamation)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Gold extraction with mercury amalgamation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Other materials production*6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Chlor-alkali production with mercury-cells	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Other production of chemicals and polymers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Production of products with mercury content*1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Application, use and disposal of dental amalgam fillings	3.0	0.1	1.3	0.2	0.2	0.6	0.6	3	1%
Use and disposal of other products	235	9.7	19.3	5.0	0.0	197.5	6.0	238	51%
Production of recycled metals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Waste incineration and open waste burning*2	197.5	197.5	0.0	0.0	0.0	0.0	0.0	198	42%
Waste deposition*2	924.4	9.2	0.1	0.0	-	-	-	9	2%
Informal dumping of general waste *2*3	63.1	6.3	6.3	50.5	-	-	-	13	3%
Waste water system/treatment *4	40.4	0.0	36.4	0.0	0.0	4.0	0.0	4	1%
Crematoria and cemeteries	6.9	0.0	0.0	0.0	0.0	0.0	0.0	7	1%
<b>TOTALS (rounded) *1*2*3*4*5*6</b>	<b>370</b>	<b>220</b>	<b>30</b>	<b>10</b>	<b>0</b>	<b>200</b>	<b>10</b>	<b>470</b>	<b>100%</b>

**Notes to table above:** \*1 To avoid double counting of mercury in products produced domestically and sold on the domestic market (including oil and gas), only the part of mercury inputs released from production are included in the input TOTAL. \*2: To avoid double counting of mercury inputs from waste and products in the input TOTAL, only 10% of the mercury input to waste incineration, waste deposition and informal dumping is included in the total for mercury inputs. These 10% represent approximately the mercury input to waste from materials which were not quantified individually in Inventory Level 1 of the Toolkit. \*3: The estimated quantities include mercury in products which has also been accounted for under each product category. To avoid double counting, the release to land from informal dumping of general waste has been subtracted automatically in the TOTALS. \*4: The estimated input and release to water include mercury amounts which have also been accounted for under each source category. To avoid double counting, input to, and release to water from, waste water system/treatment has been subtracted automatically in the TOTALS. \*5: Total inputs do not necessarily equal total outputs due to corrections for double counting (see notes\*1-\*3) and because some mercury follows products/metal mercury which are not sold in the same country or in the same year. NOTE: Releases represent some legacy influences within the waste stream.

As shown in the Table 1 and Figures 1 - 7, the following source groups contribute with the major mercury inputs:

- Application, use and disposal of dental amalgam fillings;
- Use and disposal of other products; and,
- Crematoria and cemeteries

The origin of mercury in waste and wastewater produced in the country is mercury in

products and materials. Waste fractions and wastewater do therefore not represent original mercury inputs to society (except imported waste). Waste and wastewater may however represent substantial flows of mercury through society. The following were found to be the major flows of mercury with waste and wastewater: waste deposition and waste water system/treatment.

Detailed presentation of mercury inputs and releases for all mercury release source types present in the country are shown in the following report sections.

## **Data Gaps**

### **MAJOR DATA GAPS WERE THE FOLLOWING:**

Identifying and obtaining the data and information necessary to complete Step 6 of the inventory (mercury products and substances) was a significant challenge. The Ministry of Finances (General Directorate of Customs and National Institute of Statistics), the Ministry of Health and Social Security as well as other stakeholders have been very helpful in providing insight in the number of mercury containing thermometers and medical blood pressure meters that were being calibrated each year as well as an assessment of the number of mercury containing thermometers and sphygmomanometers that was carried out in 2016 (See Chapter 8). However, based on 2016 import records obtained from the Statistical Bureau General Directorate of Customs (<http://www.dnre.gov.cv>), the Harmonized System Codes (HS) codes, which describe a category such as “Thermometers, not with other instruments, liquid-filled for direct reading”, does not allow for drawing a conclusion whether a thermometer does or does not contain mercury. It is assumed that this particular category has been overestimated.

It would be advised that Step 6 of the inventory (which focuses on data collection and inventory of the consumption of mercury contained in products, as metal mercury and as mercury containing substances) should be improved. Preferably

such research would be undertaken as part of a level 2 inventory. Such an assessment should also work closely with various local equipment suppliers/distributors so that data collection captures the use of conclusion on the number of such products in the public, private and domestic sectors.

The HS codes for various light sources alone were not sufficient to provide a mercury containing light sources. Emissions from these sources seemed to be high. It would be recommended that either the level 1 inventory can be improved by carrying out an assessment among distributors and importers on the number of mercury containing lamps imported each year, their origin and an indication of the range of mercury content. Such an assessment could also be carried out as part of a level 2 inventory.

#### **MAIN PRIORITIES FOR FURTHER ASSESSMENT [AND/OR ACTIONS]:**

*Use and disposal of other products:* Considering the “Use and disposal of other products” seems to be the most significant input category of Mercury in Cabo Verde. It is important that the data presented in Step 6 “Mercury products and substances” of the level 1 inventory accurately reflects the current situation in the country. Additional emphasis should be placed on this category during a level 2 inventory. Focus should also be on mercury containing thermometers and sphygmomanometers and light sources with mercury. In the Inventory Level 1, the import data is often unclear or even absent for certain mercury containing products (e.g. sphygmomanometer) and import data groups products and items by HS code.

The HS codes do not distinguish between for example a mercury containing thermometer or mercury-free thermometers, neither do HS codes distinguish between CFLs and fluorescent tubes (which have a different mercury content) and the mercury content in energy efficient lamps can also dramatically vary by brand. Import data needs to be compared and cross checked with information and data obtained through other sources (e.g. importers/distributors; centralized purchasing departments for the Ministry of Health; conducting assessments/survey among

users, etc.), to paint a comprehensive picture of the current situation. Such efforts to collect additional data could be carried out as part of this level 1 inventory, or additional emphasis could be placed on these mercury sources as part of a level 2 inventory.

*Mercury content of fuel for energy generation:* Cabo Verde’s imported oil, gas, coal and heavy oil should be further explored regarding specifications, origin and mercury content.

## Mercury Release Source Types Present

Table 2 shows which mercury release sources were identified as present or absent in the country. Only source types positively identified as present are included in the quantitative assessment.

It should be noted however, that the presumably minor mercury release source types shown in Table 3 were not included in the detailed source identification and quantification work. These may however be present in some regions.

*Table 2:* Identification of mercury release sources in the country; sources present (Y), absent (N), and possible but not positively identified (?).

Source category	Source present?
	Y/N/?
<b>Energy consumption</b>	
Coal combustion in large power plants	N
Coal combustion in coal fired industrial boilers	N
Other coal uses	N
Combustion/use of petroleum coke and heavy oil	N
Combustion/use of diesel, gasoil, petroleum, kerosene, LPG and other light to medium distillates	Y
Use of raw or pre-cleaned natural gas	N
Use of pipeline gas (consumer quality)	N
Biomass fired power and heat production	Y
Charcoal combustion	N
<b>Fuel production</b>	
Oil extraction	N
Oil refining	N

Extraction and processing of natural gas	N
<b>Primary metal production</b>	
Mercury (primary) extraction and initial processing	N
Production of zinc from concentrates	N
Production of copper from concentrates	N
Production of lead from concentrates	N
Gold extraction by methods other than mercury amalgamation	N
Alumina production from bauxite (aluminum production)	N
Primary ferrous metal production (pig iron production)	N
Gold extraction with mercury amalgamation - from whole ore	N
Gold extraction with mercury amalgamation - from concentrate	N
<b>Other materials production</b>	
Cement production	N
Pulp and paper production	N
<b>Production of chemicals</b>	
Chlor-alkali production with mercury-cells	N
VCM production with mercury catalyst	N
Acetaldehyde production with mercury catalyst	N
<b>Production of products with mercury content</b>	
Hg thermometers (medical, air, lab, industrial etc.)	N
Electrical switches and relays with mercury	N
Light sources with mercury (fluorescent, compact, others: see guideline)	N
Batteries with mercury	N
Manometers and gauges with mercury	N
Biocides and pesticides with mercury	N
Paints with mercury	N
Skin lightening creams and soaps with mercury chemicals	N
<b>Use and disposal of products with mercury content</b>	
Dental amalgam fillings ("silver" fillings)	Y
Thermometers	Y
Electrical switches and relays with mercury	Y
Light sources with mercury	Y
Batteries with mercury	Y
Polyurethane (PU, PUR) produced with mercury catalyst	N
Paints with mercury preservatives	N
Skin lightening creams and soaps with mercury chemicals	N
Medical blood pressure gauges (mercury sphygmomanometers)	N
Other manometers and gauges with mercury	Y
Laboratory chemicals	Y
Other laboratory and medical equipment with mercury	Y
<b>Production of recycled of metals</b>	
Production of recycled mercury ("secondary production")	N
Production of recycled ferrous metals (iron and steel)	N
Waste incineration	
Incineration of municipal/general waste	N
Incineration of hazardous waste	N
Incineration / burning of medical waste	Y

Sewage sludge incineration	N
Open fire waste burning (on landfills and informally)	Y
<b>Waste deposition/landfilling and waste water treatment</b>	
Controlled landfills/deposits	Y
Informal dumping of general waste *1	Y
Waste water system/treatment	Y
<b>Crematoria and cemeteries</b>	
Crematoria	N
Cemeteries	Y

*Table 3: Miscellaneous potential mercury sources not included in the quantitative inventory; with preliminary indication of possible presence in the country.*

Source category	Source present?
	Y/N/?
Combustion of oil shale	N
Combustion of peat	N
Geothermal power production	N
Production of other recycled metals	N
Production of lime	N
Production of light weight aggregates (burnt clay nuts for building purposes)	N
Production of other chemicals (than chlorine and sodium hydroxide) in Chlor-alkali facilities with mercury-cell technology	N
Polyurethane production with mercury catalysts	N
Seed dressing with mercury chemicals	N
Infra red detection semiconductors	N
Bougie tubes and Cantor tubes (medical)	N
Educational uses	N
Gyroscopes with mercury	N
Vacuum pumps with mercury	N
Mercury used in religious rituals (amulets and other uses)	N
Mercury used in traditional medicines (ayurvedic and others) and homeopathic medicine	N
Use of mercury as a refrigerant in certain cooling systems	N
Light houses (levelling bearings in marine navigation lights)	N
Mercury in large bearings of rotating mechanic parts in for example older waste water treatment plants	N
Tanning	N
Pigments	N
Products for browning and etching steel	N
Certain colour photograph paper types	N
Recoil softeners in rifles	N
Explosives (mercury-fulminate a.o.)	N
Fireworks	N
Executive toys	N

## Summary of mercury inputs to society

Mercury inputs to society should be understood here as the mercury amounts made available for potential releases through economic activity in the country. This includes mercury intentionally used in products such as thermometers, blood pressure gauges, fluorescent light bulbs, etc. It also includes mercury mobilised via

extraction and use of raw materials which contain mercury in trace concentrations (Table 4).

Table 4: Summary of mercury inputs to society

Source category	Source present?			Estimated Hg input, Kg Hg/y
	Y/N/?	Activity rate	Unit	Standard estimate
<b>Energy consumption</b>				
Coal combustion in large power plants	N	0	Coal combusted, t/y	-
Coal combustion in coal fired industrial boilers	N	0	Coal combusted, t/y	-
Other coal uses	N	0	Coal used, t/y	-
Combustion/use of petroleum coke and heavy oil	N	0	Oil product combusted, t/y	-
Combustion/use of diesel, gasoil, petroleum, kerosene, LPG and other light to medium distillates	Y	176.741	Oil product combusted, t/y	1
Use of raw or pre-cleaned natural gas	N	0	Gas used, Nm <sup>3</sup> /y	-
Use of pipeline gas (consumer quality)	N	0	Gas used, Nm <sup>3</sup> /y	-
Biomass fired power and heat production	N	0	Biomass combusted, t/y	-
Charcoal combustion	N	0	Charcoal combusted, t/y	-
<b>Fuel production</b>				
Oil extraction	N	0	Crude oil produced, t/y	-
Oil refining	N	0	Crude oil refined, t/y	-
Extraction and processing of natural gas	N	0	Gas produced, Nm <sup>3</sup> /y	-
<b>Primary metal production</b>				
Mercury (primary) extraction and initial processing	N	0	Mercury produced, t/y	-
Production of zinc from concentrates	N	0	Concentrate used, t/y	-
Production of copper from concentrates	N	0	Concentrate used, t/y	-
Production of lead from concentrates	N	0	Concentrate used, t/y	-
Gold extraction by methods other than mercury amalgamation	N	0	Gold ore used, t/y	-
Alumina production from bauxite (aluminium production)	N	0	Bauxite processed, t/y	-
Primary ferrous metal production (pig iron production)	N	0	Pig iron produced, t/y	-
Gold extraction with mercury amalgamation - from whole ore	N	0	Gold produced, kg/y	-
Gold extraction with mercury amalgamation - from concentrate	N	0	Gold produced, kg/y	-
<b>Other materials production</b>				
Cement production*4	N	0	Cement produced, t/y	-
Pulp and paper production	N	0	Biomass used for production, t/y	-
<b>Production of chemicals</b>				
Chlor-alkali production with mercury-cells	N	0	Cl <sub>2</sub> produced, t/y	-
VCM production with mercury catalyst	N	0	VCM produced, t/y	-
Acetaldehyde production with mercury catalyst	N	0	Acetaldehyde produced, t/y	-
<b>Production of products with mercury content</b>				
Hg thermometers (medical, air, lab, industrial etc.)	N	0	Mercury used for production, kg/y	-

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Electrical switches and relays with mercury	N	0	Mercury used for production, kg/y	-
Light sources with mercury (fluorescent, compact, others: see guideline)	N	0	Mercury used for production, kg/y	-
Batteries with mercury	N	0	Mercury used for production, kg/y	-
Manometers and gauges with mercury	N	0	Mercury used for production, kg/y	-
Biocides and pesticides with mercury	N	0	Mercury used for production, kg/y	-
Paints with mercury	N	0	Mercury used for production, kg/y	-
Skin lightening creams and soaps with mercury chemicals	N	0	Mercury used for production, kg/y	-
<b>Use and disposal of products with mercury content</b>				
Dental amalgam fillings ("silver" fillings)	Y	530.931	Number of inhabitants	3
Thermometers	Y	43.000	Items sold/y	43
Electrical switches and relays with mercury	Y	530.931	Number of inhabitants	50
Light sources with mercury	Y	461.188	Items sold/y	6
Batteries with mercury	Y	0	t batteries sold/y	120
Polyurethane (PU, PUR) produced with mercury catalyst	N	530.931	Number of inhabitants	-
Paints with mercury preservatives	N	0	Paint sold, t/y	-
Skin lightening creams and soaps with mercury chemicals	N	0	Cream or soap sold, t/y	-
Medical blood pressure gauges (mercury sphygmomanometers)	N	0	Items sold/y	-
Other manometers and gauges with mercury	Y	530.931	Number of inhabitants	2
Laboratory chemicals	Y	530.931	Number of inhabitants	4
Other laboratory and medical equipment with mercury	Y	530.931	Number of inhabitants	14
<b>Production of recycled of metals</b>				
Production of recycled mercury ("secondary production")	N	0	Mercury produced, kg/y	-
Production of recycled ferrous metals (iron and steel)	N	0	Number of vehicles recycled/y	-
<b>Waste incineration</b>				
Incineration of municipal/general waste	N	0	Waste incinerated, t/y	-
Incineration of hazardous waste	N	0	Waste incinerated, t/y	-
Incineration / burning of medical waste	Y	1	Waste incinerated, t/y	0
Sewage sludge incineration	N	0	Waste incinerated, t/y	-
Open fire waste burning (on landfills and informally)	Y	39.499	Waste burned, t/y	197
<b>Waste deposition/landfilling and waste water treatment</b>				
Controlled landfills/deposits	Y	184.870	Waste landfilled, t/y	924
Informal dumping of general waste *1	Y	12.623	Waste dumped, t/y	63
Waste water system/treatment	Y	7,696,080	Waste water, m3/y	40
<b>Crematoria and cemeteries</b>				
Crematoria	N	0	Corpses cremated/y	-
Cemeteries	Y	2,744	Corpses buried/y	7
<b>TOTAL of quantified inputs*1*2*3*4</b>				<b>370</b>

The following source sub-categories made the largest contributions to mercury inputs to society. Mercury from waste is included as a small percent of the estimated Hg input to avoid double-counting.

1. Controlled landfills/deposits (924 kg Hg/y)
2. Open fire waste burning (on landfills and informally) (197 kg Hg/y)
3. Batteries with mercury (120 kg Hg/y)
4. Informal dumping of general waste (63k/Hg)
5. Electrical switches and relays with mercury (50 kg Hg/y)

## Summary of mercury releases

In the Table 5 below, a summary of mercury releases from all source categories present is given. The key mercury releases here are releases to air (the atmosphere), to water (marine and freshwater bodies, including via waste water systems), to land, to general waste, and to sectors specific waste treatment. An additional output pathway is "by-products and impurities" which designate mercury flows back into the market with by-products and products where mercury does not play an intentional role. See Table 6 below for a more detailed description and definition of the output pathways.

*Table 5: Summary of mercury releases*

Source category	Estimated mercury releases, standard estimates, Kg Hg/y					
	Air	Water	Land	By-products and impurities	General waste	Sector specific waste treatment /disposal
<b>Energy consumption</b>						
Coal combustion in large power plants	-	-	-	-	-	-
Coal combustion in coal fired industrial boilers	-	-	-	-	-	-
Other coal uses	-	-	-	-	-	-
Combustion/use of petroleum coke and heavy oil	-	-	-	-	-	-
Combustion/use of diesel, gasoil, petroleum, kerosene, LPG and other light to medium distillates	1.0	0.0	0.0	0.0	0.0	0.0
Use of raw or pre-cleaned natural gas	-	-	-	-	-	-
Use of pipeline gas (consumer quality)	-	-	-	-	-	-
Biomass fired power and heat production	-	-	-	-	-	-
Charcoal combustion	-	-	-	-	-	-

<b>Fuel production</b>						
Oil extraction	-	-	-	-	-	-
Oil refining	-	-	-	-	-	-
Extraction and processing of natural gas	-	-	-	-	-	-
<b>Primary metal production</b>						
Mercury (primary) extraction and initial processing	-	-	-	-	-	-
Production of zinc from concentrates	-	-	-	-	-	-
Production of copper from concentrates	-	-	-	-	-	-
Production of lead from concentrates	-	-	-	-	-	-
Gold extraction by methods other than mercury amalgamation	-	-	-	-	-	-
Alumina production from bauxite (aluminium production)	-	-	-	-	-	-
Primary ferrous metal production (pig iron production)	-	-	-	-	-	-
Gold extraction with mercury amalgamation - from whole ore	-	-	-	-	-	-
Gold extraction with mercury amalgamation - from concentrate	-	-	-	-	-	-
<b>Other materials production</b>						
Cement production*3	-	-	-	-	-	-
Pulp and paper production	-	-	-	-	-	-
<b>Production of chemicals</b>						
Chlor-alkali production with mercury-cells	-	-	-	-	-	-
VCM production with mercury catalyst	-	-	-	-	-	-
Acetaldehyde production with mercury catalyst	-	-	-	-	-	-
<b>Production of products with mercury content</b>						
Hg thermometers (medical, air, lab, industrial etc.)	-	-	-	-	-	-
Electrical switches and relays with mercury	-	-	-	-	-	-
Light sources with mercury (fluorescent, compact, others: see guideline)	-	-	-	-	-	-
Batteries with mercury	-	-	-	-	-	-
Manometers and gauges with mercury	-	-	-	-	-	-
Biocides and pesticides with mercury	-	-	-	-	-	-
Paints with mercury	-	-	-	-	-	-
Skin lightening creams and soaps with mercury chemicals	-	-	-	-	-	-
<b>Use and disposal of products with mercury content</b>						
Dental amalgam fillings ("silver" fillings)	0.1	1.3	0.2	0.2	0.6	0.6
Thermometers	4.3	12.9	0.0	0.0	25.8	0.0
Electrical switches and relays with mercury	5.0	0.0	5.0	0.0	39.8	0.0
Light sources with mercury	0.3	0.0	0.0	0.0	5.3	0.0
Batteries with mercury	0.0	0.0	0.0	0.0	11.6	0.0
Polyurethane (PU, PUR) produced with mercury catalyst	-	-	-	-	-	-
Paints with mercury preservatives	-	-	-	-	-	-
Skin lightening creams and soaps with mercury chemicals	-	-	-	-	-	-
Medical blood pressure gauges (mercury sphygmomanometers)	-	-	-	-	-	-
Other manometers and gauges with mercury	0.2	0.5	0.0	0.0	1.1	0.0
Laboratory chemicals	0.0	1.2	0.0	0.0	1.2	1.2

Other laboratory and medical equipment with mercury	0.0	4.7	0.0	0.0	4.7	4.8
<b>Production of recycled of metals</b>						
Production of recycled mercury ("secondary production")	-	-	-	-	-	-
Production of recycled ferrous metals (iron and steel)	-	-	-	-	-	-
<b>Waste incineration</b>						
Incineration of municipal/general waste	-	-	-	-	-	-
Incineration of hazardous waste	-	-	-	-	-	-
Incineration / burning of medical waste	0.0	0.0	0.0	0.0	0.0	0.0
Sewage sludge incineration	-	-	-	-	-	-
Open fire waste burning (on landfills and informally)	197.5	0.0	0.0	0.0	0.0	0.0
<b>Waste deposition/landfilling and waste water treatment</b>						
Controlled landfills/deposits	9.2	0.1	0.0	-	-	-
Informal dumping of general waste *1	6.3	6.3	50.5	-	-	-
Waste water system/treatment *2	0.0	36.4	0.0	0.0	4.0	0.0
<b>Crematoria and cemeteries</b>						
Crematoria	-	-	-	-	-	-
Cemeteries	0.0	0.0	6.9	-	0.0	0.0
<b>TOTAL of quantified releases*1*2*</b>	<b>220.0</b>	<b>30.0</b>	<b>10.0</b>	<b>0.0</b>	<b>200.0</b>	<b>10.0</b>

Notes to table above: \*1: The estimated quantities include mercury in products which has also been accounted for under each product category. To avoid double counting, the release to land from informal dumping of general waste has been subtracted automatically in the TOTALS. \*2: The estimated release to water includes mercury amounts which have also been accounted for under each source category. To avoid double counting, input to, and release to water from, waste water system/treatment have been subtracted automatically in the TOTALS.

Note that the following source sub-categories made the largest contributions to mercury releases to the atmosphere. Mercury from waste is included as a small percent of the estimated mercury input to avoid double-counting.

1. Open fire waste burning (on landfills and informally) (197.5 Kg Hg/y)
2. Controlled landfills/deposits (9.2 Kg Hg/y)
3. Informal dumping of general waste (6.3 kg Hg/y)
4. Electrical switches and relays with Mercury (5.0 kg Hg/y)

Table 6 below provides general descriptions and definitions of the output pathways.

Table 6: Description of the types of results.

Calculation result type	Description
<b>Estimated mercury input, Kg Hg/y</b>	The standard estimate of the amount of mercury entering this source category with input materials, for example calculated mercury amount in coal used annually in the country for combustion in large power plants.
<b>Air</b>	Mercury emissions to the atmosphere from point sources and diffuse sources from which mercury may be spread locally or over long distances with air masses; for example, from: <ul style="list-style-type: none"> <li>• Point sources such as coal fired power plants, metal smelter, waste incineration;</li> <li>• Diffuse sources such as small-scale gold mining, informal burning of waste with fluorescent lamps, batteries, thermometers.</li> </ul>
<b>Water</b>	Mercury releases to aquatic environments and to waste water systems; point sources and diffuse sources from which mercury will be spread to marine environments (oceans), and freshwaters (rivers, lakes, etc.). for example, releases from: <ul style="list-style-type: none"> <li>• Wet flue gas cleaning systems on coal fired power plants;</li> <li>• Industry, households, etc. to aquatic environments;</li> <li>• Surface run-off and leachate from mercury contaminated soil and waste dumps.</li> </ul>
<b>Land</b>	Mercury releases to the terrestrial environment: General soil and ground water. For example, releases from: <ul style="list-style-type: none"> <li>• Solid residues from flue gas cleaning on coal fired power plants used for gravel road construction;</li> <li>• Uncollected waste products dumped or buried informally;</li> <li>• Local unconfined releases from industry such as on site hazardous waste storage/burial;</li> <li>• Spreading of sewage sludge with mercury content on agricultural land (sludge used as fertilizer);</li> <li>• Application on land, seeds or seedlings of pesticides with mercury compounds.</li> </ul>
<b>By-products and impurities</b>	By-products that contain mercury, which are sent back into the market and cannot be directly allocated to environmental releases, for example: <ul style="list-style-type: none"> <li>• Gypsum wallboard produced from solid residues from flue gas cleaning on coal fired power plants;</li> <li>• Sulphuric acid produced from desulphurization of flue gas (flue gas cleaning) in non-ferrous metal plants with mercury trace concentrations;</li> <li>• Chlorine and sodium hydroxide produced with mercury-based chlor-alkali technology; with mercury trace concentrations;</li> <li>• Metal mercury or calomel as by-product from non-ferrous metal mining (high mercury concentrations).</li> </ul>
<b>General waste</b>	General waste: Also called municipal waste in some countries. Typically, household and institution waste where the waste undergoes a general treatment, such as incineration, landfilling or informal dumping. The mercury sources to waste are consumer products with intentional mercury content (batteries, thermometers, fluorescent tubes, etc.) as well as high volume waste like printed paper, plastic, etc., with small trace concentrations of mercury.
<b>Sector specific waste treatment /disposal</b>	Waste from industry and consumers which is collected and treated in separate systems, and in some cases recycled; for example: <ul style="list-style-type: none"> <li>• Confined deposition of solid residues from flue gas cleaning on coal fired power plants on dedicated sites;</li> <li>• Hazardous industrial waste with high mercury content which is deposited in dedicated, safe sites;</li> <li>• Hazardous consumer waste with mercury content, mainly separately collected and safely treated batteries, thermometers, mercury switches, lost teeth with amalgam fillings, etc.;</li> <li>• Confined deposition of tailings and high-volume rock/waste from extraction of non-ferrous metals.</li> </ul>

## **Data and Inventory on Energy Consumption and Fuel Production**

### **COMBUSTION/USE OF DIESEL, GASOIL, PETROLEUM AND KEROSENE**

Petroleum products are intended mostly for the sectors of transport, electricity generation, manufacturing and to a minor level household use (LPG).

Data for this category has been extracted from the Economic Regulation Agency (ARE) Report 2016. The consumption figures for 2016 (combining Gasoline, Diesel oil, Aviation Fuel, Kerosene and LPG) added up to 176,741 ton.

### **USE OF RAW OR PRE-CLEANED NATURAL GAS**

In Cabo Verde, there is currently no oil extraction, oil refining or natural gas extraction and processing.

### **USE OF PIPELINE GAS (CONSUMER QUALITY)**

In Cabo Verde the distribution of gas (LPG) for domestic consumption is done in 6 and 12-kg metal containers and no pipeline gas are available. Source: Vivo Energy and Enacol S.A.

### **BIOMASS FIRED POWER AND HEAT PRODUCTION**

There is no use of biomass for the production of heat and electricity in Cabo Verde.

### **CHARCOAL COMBUSTION**

In Cabo Verde, charcoal is produced only on the islands of Maio, Boavista and Saint Vicente. The collection and processing of data on the production of firewood and coal are under the responsibility of the Ministry of Agriculture and Environment. However, the Directorate-General for Energy accounts for the energy produced through firewood and coal. For the amount normally consumed since 2010, the charcoal market can be considered small and is mainly used for catering.

## **FUEL PRODUCTION (OIL EXTRACTION, OIL REFINING, EXTRACTION AND PROCESSING OF NATURAL GAS)**

There is currently no oil extraction, oil refining or extraction and processing of natural gas in Cabo Verde.

## **Data and Inventory on Domestic Production of Metals and Raw Materials**

In summary, there is no domestic production of metals and raw materials in Cabo Verde. Data and inventory on domestic production and processing with intentional mercury use.

### **PRODUCTION OF CHEMICALS**

There is no domestic production of chemicals, which involves the use of a mercury catalyst or mercury cells. Regarding the production of Polyvinyl Chloride (PVC), Vinyl Chloride Monomer (VCM), the “building stone” for PVC, is imported as pellets for the manufacture of PVC pipes in Cabo Verde.

### **PRODUCTION OF PRODUCTS WITH MERCURY CONTENT**

Cabo Verde does not manufacture products containing mercury such as thermometers with mercury, light sources with mercury, manometers/gauges with mercury, biocides & pesticides with mercury, batteries with mercury, paints with mercury or skin lightening creams and soaps with mercury).

## **Data and Inventory on Waste Handling and Recycling**

### **QUESTION ABOUT GENERAL WASTE MANAGEMENT SETUP**

The overall questions about waste treatment setup in the country were answered as follows:

Please answer questions about the current waste treatment set-up in your country:	Y/N		Y/N
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<p><b>a)</b> Is more than 2/3 (two thirds = 67%) of the general waste collected and deposited on lined landfills or incinerated in closed incinerators?</p>	<p>Y</p>	<p><b>b)</b> Is more than 1/3 (one third = 33%) of the mercury-added products waste safely collected and treated separately?</p>	<p>N</p>
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### **PRODUCTION OF RECYCLED MERCURY (“SECONDARY PRODUCTION”)**

The production of recycled mercury does not take place in Cabo Verde (source: ANAS and DNA).

### **PRODUCTION OF RECYCLED FERROUS METALS (IRON AND STEEL)**

The production of recycled ferrous metals does not occur in Cabo Verde.

### **INCINERATION OF MUNICIPAL/GENERAL WASTE**

An incinerator for municipal/general waste is not present in Cabo Verde. The landfill at Sal Island is the only engineered landfill site in the country and it is assumed that most collected refuse is deposited here and properly managed.

### **INCINERATION OF HAZARDOUS WASTE**

Incineration of hazardous waste does not take place in Cabo Verde.

### **INCINERATION AND OPEN BURNING OF MEDICAL WASTE**

The health system in Cabo Verde is organized with central hospitals, regional hospitals, health centers and basic health units. There are some hospital waste incinerators in the country, but currently, the only functional incinerator is located at Regional Hospital of Santiago Norte. For other health facilities, hazardous waste (organic waste, overdue or unused vaccines, etc) is either burned in the open air or buried in cemeteries. Other hazardous waste (needles, etc.) generated by hospitals is collected and rejected together with Municipal Solid Waste (MSW) for landfilling. According to data from ANAS, about 11,908 tonnes of hospital waste (including corpses sent for burial) is annually produced in Cape Verde and is landfilled, but a small (1 tonne per year) amount (placentas, etc.) is sent for incineration at the Regional Hospital of Santiago Norte.

And since a very small part (placentas, perforating and cutting) are sent to their

incineration at the Regional Hospital of Santiago Norte, one part is sent to be buried in the municipal cemeteries (Anatomical pieces) and most are sent to the municipal dumps where they are burnt open and buried or buried. We assume that they are incinerated according to the health services of Cape Verde (Santiago Island), one tonnes/ year was used as input to the inventory kit.

Mercury emissions resulting from incineration and open burning are heavily influenced by the mercury content of the waste being incinerated/burned. It is unclear at this stage of the inventory how many mercury-containing medical devices are broken or discarded each year, however, whether these are incinerated along with the infectious waste streams or disposed of separately has a major impact on the release of mercury emissions to flue gas and incinerator ashes.

#### **SEWAGE SLUDGE INCINERATION**

Sewage sludge incineration does not take place in Cabo Verde.

#### **OPEN FIRE WASTE BURNING (ON LANDFILLS AND INFORMALLY)**

Based on the assumption that 93% of municipal/general waste is collected and taken to municipal dumps and landfills, 21% of generated municipal/general waste is not burned in the open. The burning of waste at Sal Landfill is not practiced and if spontaneous ignition occurs such small fires are extinguished. In 2016, the total amount of municipal/general waste landfilled at municipal dumps and Sal Landfill was 184,870 tonnes (ANAS). If this amount of waste represents 100%, the corresponding 21% of municipal/general waste this inventory assumes is being burned in the open, corresponds to 39499 tonnes/year.

#### **CONTROLLED LANDFILLS/DEPOSITS**

In 2016, the total amount of municipal/general waste dumped and landfilled was 184,870 tonnes (ANAS, 2016).

#### **INFORMAL DUMPING OF GENERAL WASTE**

Based on the assumption that 93% of municipal/general waste is collected and

taken to municipal dumps and landfills, 7% of uncollected municipal/general waste, is most likely informally dumped or burned in the open.

In 2016, the total amount of municipal/general waste landfilled at municipal dumps and Sal landfill was 184,870 tonnes (ANAS), if this amount of waste represents 100% of the general waste amount generated in the country, the corresponding 7% of municipal/general waste this inventory assumes is being illegally dumped, corresponds to 12,623 tonnes/year.

### WASTE WATER SYSTEM/TREATMENT

According to ANAS and INE (2016), Cabo Verde produced and treated about 7 Mm<sup>3</sup>/year of waste water in 2016. Data and inventory on general consumption of mercury in products, as metal mercury and as mercury containing substances

### GENERAL BACKGROUND DATA

Background calculations for the product groups listed below were based on the data on population, electrification rate and dental personnel density shown in Table 7.

Sub-category	Data types used as activity rates
Dental amalgam fillings ("silver" fillings)	Population, density of dental personnel
Electrical switches and relays with mercury	Population, electrification rate (percent of population with access to electricity)
Other manometers and gauges with mercury	Population, electrification rate (percent of population with access to electricity)
Laboratory chemicals	Population, electrification rate (percent of population with access to electricity)
Other laboratory equipment with mercury	Population, electrification rate (percent of population with access to electricity)

*Table 7: Background data for default calculations for dental amalgam and certain other product types.*

<b>BACKGROUND DATA FOR DEFAULT CALCULATIONS AND RANGE TEST</b>			
<b>Country</b>	<b>Population in 2016</b>	<b>Dental personnel per 1000 inhabitants</b>	<b>Electrification rate, % of population with access to electricity</b>
<b>Cabo Verde</b>	<b>530,931</b>	<b>0.023</b>	<b>67</b>

The data in Table 7 are provided as part of the Toolkit. For most countries they are based on authoritative international data sources (population data: UNSD; Dental data: WHO; Electrification data: IEA). For a few countries, data from these sources have not been available and other sources were used as described in the Toolkit Reference Report's Annex 8.4.

The data for products that may contain mercury and were imported into Cabo Verde in 2016 is presented in Table 8 (Statistics 2016).

*Table 8: Harmonized System (HS) codes for mercury containing products and related import data for 2016*

(DGA, 2016).

<b>HS Custom Code</b>	<b>Description of HS Code</b>	<b>Total Quantity</b>	<b>Included in</b>
<b>Thermometers</b>			
90251100	Thermometers, not with other instruments, liquid-filled for direct reading <i>Argumentation: A certain percentage of these might contain mercury, others might contain other liquids such as alcohol.</i>	43,000	Yes
90251190	Thermometers, not combined with other instruments, excl. 902511. <i>Argumentation: Most likely these are thermometers that do not contain liquids, therefore it is unlikely the contain mercury.</i>	NA	No
<b>Light Sources with Mercury</b>			
<b>85393100</b>	Discharge lamps, other than ultra-violet lamps, fluorescent, hot cathode <i>It was assumed that this category refers to gas discharge lamps and high intensity discharge lamps, therefore it was likely that such lamps contain mercury.</i>	210,670	Yes

<b>85393200</b>	Mercury or sodium vapor lamps; metal halide lamps* <i>These lamps contain mercury</i>	2,290	Yes
<b>85393910</b>	Low energy consumption lamps* <i>It is assumed that this HS description refers to compact fluorescent lamps (CFLs) and fluorescent tubes, it was assumed that the majority of these lamps contain mercury.</i>	396,400	Yes
<b>85393990</b>	<i>Discharge lamps, other than ultra-violet, low energy and fluorescent lamps. It is assumed that this category describes incandescent lights.</i>	NE	No
<b>85394900</b>	<i>Ultra-violet or infrared lamps excl. arc-lamps Includes mercury containing ultraviolet fluorescent lamps used for tanning beds as well as infrared lamps, which do not contain mercury. As it is unlikely that tanning salons exist in Cabo Verde, although some might exist in the hotels tailoring to tourists. It is assumed however, that of this category does not contain mercury.</i>	15,604	No
<b>Batteries with Mercury</b>			
85061000	Manganese dioxide primary cells or batteries	0.372 t	Yes
<b>85066000</b>	Air-zinc primary cells or batteries <i>Argumentation: Includes only part of the battery types in the Toolkit Category</i>	0.078t	Yes
<b>Medical Blood Pressure Gauges (Mercury Sphygmomanometers)</b>			
No reference was found in the import records of any sphygmomanometers being imported, however, this is not realistic, and potentially a particular HS code describing this category was overlooked.			

### **ADDITIONAL INFORMATION: USE OF MERCURY IN DENTAL AMALGAM**

For about 15 years the Ministry of Health has had an oral health education policy. Although import records do not provide any information on the quantities of dental amalgam that are imported on a yearly basis, the Ministry of Health confirmed that public dental institutions still use mercury dental amalgam. Dental amalgam for this purpose is imported in premixed single dose capsules and no mixing using elemental mercury is taking place in public healthcare facilities and/or public dental clinics.

Currently, there is no dental amalgam phase-out plan in place, however, dentists have been advised not to use dental amalgam on pregnant women and children. In addition, based on a number of information interviews, private and public dentists seem to favour composite fillings rather than dental amalgam and it appears that

dental amalgam use in Cabo Verde has greatly diminished.

### **THERMOMETERS & OTHER GLASS MERCURY THERMOMETERS**

The HS for mercury containing clinical thermometers was not found in the custom import records, however, as suggested by the Guidelines for Inventory Level 1, HS code 90251100 was used to identify “Thermometers, not with other instruments, liquid-filled for direct reading” (see Table 9).

*Table 9:* Thermometers, not with other instruments, liquid-filled for direct reading.

HS Custom Code	Description of HS Code	Total Quantity	Included in Inventory
<b>Thermometers</b>			
90251100	Thermometers, not with other instruments, liquid-filled for direct reading Argumentation: A certain percentage of these might contain mercury, others might contain other liquids such as alcohol.	43,000	Yes

This group might also contain thermometers with other types of liquid (such as alcohol) so it cannot be concluded that this category exclusively represents mercury containing thermometers. It would be worthwhile to carry out a comprehensive survey among a selection of public and private healthcare facilities as well as households on the number and types of clinical thermometers being used.

### **LIGHT SOURCES WITH MERCURY**

As suggested by the Guidelines for Inventory Level 1, the HS codes included in Table 9 below, represent product categories which may include products that contain mercury. Not all the items captured by an HS code contain mercury and the mercury content for each product varies based on its size, brand, etc. As described in the argumentation for each of these HS codes, not all the items captured by such a HS code contain mercury. Secondly, the mercury content for each of these products varies based on its size, the brand, etc.

*Table 10:* Light sources, which may contain mercury.

HS Custom Code	Description of HS Code	Total Quantity	Included in Inventory
<b>Light Sources with Mercury</b>			
85393100	Discharge lamps, other than ultra-violet lamps, fluorescent, hot cathode <i>It was assumed that this category refers to gas discharge lamps and high Intensity Discharge Lamps, therefore it was likely that such lamps contain mercury</i>	210,670	Yes
85393200	Mercury or sodium vapor lamps; metal halide lamps* <i>Contain mercury</i>	2,290	Yes
85393910	Low energy consumption lamps* <i>It was assumed that this HS description refers to Compact Fluorescent Lamps (CFLs) and fluorescent tubes, leading to the conclusion that most of these lamps contain mercury.</i>	396,400	Yes

Source: General Direction of Customs, 2016

All potentially mercury containing lamps were combined (609,360), and it was assumed that 60% of these lamps represent CFLs (365,616), 30% fluorescent tubes (182,808) and 10% other mercury containing lamps (60,936), as based on the Inventory Level 2 conducted in Uruguay.

## Data gaps and priorities for potential follow up

For this step of the inventory, like for the category on thermometers, it was hard to estimate how many of the items contain mercury, and what the level of mercury is that they contain. For example, fluorescent tubes contain more mercury than CFLs, but the distribution between types of such lamps must be obtained in another way than exclusively through Import Data (e.g. through distributors).

### BATTERIES WITH MERCURY

Mercury oxide batteries are still being imported into Cabo Verde, but these imports have been gradually decreasing with mercury oxide batteries replacing Ni / Cd batteries.

## **PAINTS WITH MERCURY PRESERVATIVES**

Mercury paints are not produced in Cabo Verde. Further research on the mercury content of car paints (metallic paints) and mercury content of road paints and amounts would be a worthwhile focus when conducting an Inventory Level 2.

## **TOYS CONTAINING MERCURY**

Data on the mercury content of imported toys is not readily available for Cabo Verde.

## **COSMETICS CONTAINING MERCURY**

The trade of mercury containing cosmetics is banned in Cabo Verde, however, this cannot be guaranteed for shipments received through unregistered imports. The Agency for the Regulation and Supervision of Pharmaceutical and Food Products (ARFA) is working to strengthen the enforcement of the ban on mercury containing cosmetics in Cabo Verde. Testing of incoming cosmetics and other products suspected of containing mercury will be made mandatory in the future. Data and inventory on crematoria and cemeteries.

## **CREMATORIA**

Cremation is not practiced in Cape Verde, but the government is working to start this practice in the near future.

## **CEMETERIES**

There were 2,744 registered deaths in Cabo Verde in 2015, an increase of approximately 7.2% as compared to 2014 (Statistical Report 2015 \_Versão\_Final (24 April Corrected Version2) - Ministry of Health and Social Security).

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[http://www.unep.org/hazardoussubstances/Portals/9/Mercury/A\\_Inventories/Hg-Toolkit-IL1-Report-Template.docx](http://www.unep.org/hazardoussubstances/Portals/9/Mercury/A_Inventories/Hg-Toolkit-IL1-Report-Template.docx)

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Vivo Energy and Enacol S.A.

## Appendix 1 - Personal contacts

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## **Chapter III: Policy, Regulatory and Institutional Framework Assessment**

### **SUMMARY:**

The Minamata Convention on Mercury, opened for signature in October of 2013, is a global treaty specifically designed to protect human health and the environment from the adverse effects of mercury. Under the Minamata Convention, individual countries are charged with protecting human health and the environment from the risks of mercury exposure by systematically controlling mercury emissions and releases, including phasing out the use of mercury in certain products and processes. The Government of Cabo Verde has not signed the Convention but is taking steps towards ratification/accession.

The review of existing legislation revealed that current Cabo Verdean laws will require updating to meet the requirements of the Convention. Even though existing legislation was not specifically conceived to deal with mercury phase out and control issues, they do cover some aspects of the Minamata Convention including mercury in food products and cosmetics. Moreover, there is a broad scope of environmental laws in Cabo Verde that allow for the insertion of specific provisions when the need is identified. This includes air emissions, solid waste and waste water management provisions. Additionally, legislation is currently being drafted to address biocides and waste management facilities.

Cabo Verde is a small country with a structured regulatory framework in place. Cabo Verde is a Party to the Basel, Rotterdam and Stockholm Conventions and can benefit from the existing regulations already in place for these conventions.

The legislative gap analysis identified gaps in the following areas that will need to be addressed in order for Cabo Verde to comply with the convention obligations: i) mercury-added products phase out and management will need to be addressed according to Article 4 and Annex A of the Convention, ii) regulations covering solid waste will need to include mercury management, storage and disposal; iii) air quality control laws should be updated in order to make the regulations more robust.

In addition to these gaps, there is a need to increase awareness among key stakeholders and the public about mercury and its environmental and health impacts to ensure the effectiveness of proposed elimination programs. Establishing a coordinating entity to monitor the activities needed to adopt the Convention is recommended.

The Convention focuses on the management of mercury through its full life cycle. The following are some of the main areas covered under the Convention:

Article 3: Mercury Supply Sources and Trade;

Article 4: Mercury-added Products;

Article 5: Manufacturing Processes in which Mercury or Mercury Compounds are used;

Article 7: Artisanal and Small-scale Gold Mining (ASGM);

Article 8: Air Emissions;

Article 9: Releases to Land and Water;

Article 10: Environmentally Sound Interim Storage of Mercury, other than Mercury Waste;

Article 11: Mercury Wastes;

Article 12: Contaminated Sites;

Article 16: Health Aspects;

Article 13: Financial Resources and Mechanism;

Article 17: Information Exchange; and,

Article 18: Public Information, Awareness and Education.

## **LAWS RELATING TO CHEMICALS AND WASTES**

### **SYSTEM OF GOVERNMENT IN CABO VERDE**

According to the Cabo Verdean political organization principles (set forth on articles 119.<sup>o</sup> thru 124.<sup>o</sup> of the Constitution<sup>2</sup>), there are four organs of sovereignty: the President of the Republic; the Parliament, the Government<sup>3</sup> (Executive power) and the Courts. The constitution is based on the interdependency and mutual control of powers.

Under the Cabo Verdean constitutional system, there are four main functions of the State: legislative, political, administrative, and judicial. The legislative and political

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<sup>2</sup> The Constitution in force is Constitutional Law n.º1/IV/92 as of 25 Sep revised by Constitutional Law n.º 1/VII/2010)

<sup>3</sup> “Governor”

functions consist in defining the main political choices for the country that will be further developed through the administrative powers.<sup>4</sup>

The Parliament and the Government (See articles 175.<sup>o</sup> and 204.<sup>o</sup>, of the Constitution) share the political and legislative powers which are subject to the President of the Republic's control (who can approve or veto a legislative bill).

Some legislative matters are subject to Parliamentary *reserve* (articles 176.<sup>o</sup>, 177.<sup>o</sup> and 182.<sup>o</sup> of the Constitution). The *parliamentary reserve* can be absolute (only the Parliament can legislate on the subject) or relative (in this case there must be a legislative authorization by the Parliament to the Government to issue a *Legislative-Decree*).

When the legislative matter is not under parliamentary reserve, the legislative power is shared concurrently between the Parliament (which can issue a Law, *stricto sensu*) and the Government (which issues *Decree-Laws*).

## **TYPES AND HIERARCHY OF LAWS**

The following are the types of laws according to their hierarchy, which is set on article 268.<sup>o</sup> of the Cabo Verdean Constitution:

1. Laws (enacted by the Parliament), Decrees, Decree-Laws and Legislative-Decrees.
2. Administrative Regulations by the Government, Municipalities, Regulatory Agencies, and other Authorities vested in administrative powers by law.

Laws, Decrees<sup>5</sup>, Decree-Laws and Legislative-Decrees are instruments of the legislative function of the state referred to jointly in this report as Solemn laws or Formal Law. Solemn Laws must be sent to the President of the Republic for approval or veto based on political reasons or following the declaration of unconstitutionality

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<sup>4</sup> For further information on Portuguese speaking countries' constitutional systems refer to Marcelo Rebelo de Sousa, *Lições de Direito Administrativo*, Lex Editora, Volume I, 1999.

<sup>5</sup> Decrees are the legal instrument through which the Government approves an International Convention. Article 261.<sup>o</sup>, paragraph 2, line a) of the Constitution.

by the Constitutional Court<sup>6</sup>. Laws, Decree-Laws and Legislative-Decrees have the same hierarchic value (notwithstanding the obligation of Legislative-Decrees to conform with the Legislative Authorization<sup>7</sup>) and prevail over any administrative regulations (article 260.<sup>º</sup>, 261.<sup>º</sup> and 268.<sup>º</sup> of the Constitution<sup>8</sup>).

Resolutions<sup>9</sup> are another type of legal instrument and may be set either by the Parliament or the Government (Executive) and usually regulate political or proclamatory issues. Hierarchically under the referred Solemn Laws, the Cabo Verdean system predicts the Administrative Regulations (article 264.<sup>º</sup> of the Constitution). Administrative Regulations are instruments that operationalize the contents of the solemn laws and are a (mandatory) competency of the Government (which is attained through Regulating-Decrees<sup>10</sup>, ordinances<sup>11</sup> and orders) and other public entities such as the Municipalities and Regulatory Agencies. Customary law has a relatively reduced importance under the Cabo Verdean legal system and, according to the civil code, only are accepted when determined by Law (legislative instrument).

## LAWS

Cabo Verde has the following main environmental laws that could be affected once the country ratifies the Minamata Convention.

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<sup>6</sup> For the powers of the President concerning the approval of laws please refer to articles 135, paragraph 1, lines r) and s), as well as paragraph 2, line b); see also article 137.<sup>º</sup> and 138.<sup>º</sup>

<sup>7</sup> Legislative-Authorization is the Law issued by the Parliament in matters under its relative reserve through which the Parliament authorizes the Government to legislate. See articles 177.<sup>º</sup> and 182.<sup>º</sup> of the Constitution.

<sup>8</sup> For the hierarchical value of Decrees please refer to Pina Delgado, 2017 and section 2.14 of this Report

<sup>9</sup> Resolutions are regulated under article 265.<sup>º</sup> of the Constitution and may be issued by the Parliament or the Government

<sup>10</sup> Regulating-Decrees or “Decretos-Regulamentares” are administrative regulations approved by the conseil of Ministers and are other Government regulations must abide by them.

<sup>11</sup> There are three types of regulations issued by the Government, in use of executive or administrative powers under article 264.<sup>º</sup> of the Constitution: Decretos-Regulamentares (Regulating-Decrees); Portarias (Ordinances) and Despachos (Orders)

### **Basic Environment Law (BEL) - Law n.º 86/IV/93 as of 26 July, 1993**

The Basis Environmental Law (BEL) aims to promote overall environmental quality and sets general principles and provisions for protecting the quality of air, water, flora, fauna, soil and subsoil.

This law also determines that for all the environment media referred above which regulations should be enacted. These regulations will be analyzed in greater detail later in this report together with Article 8, 9 and 16 of the Convention. That said, some very important provisions are set forth in article 23.º of BEL and worth mentioning here:

- Paragraph 1 which regulates prevention of pollution derived from chemicals and predicts a series of measures on:
  - Line (b) need for systematic evaluation of the potential effects of chemical compounds on humans and the environment;
  - Line (c) control of production, commerce, use and disposal of chemical compounds;
  - Line (e) allocation of fiscal and financial mechanisms to promote recycling and use of waste; and,
  - Line (g) promotion of information to the public in general.
  
- Paragraph 2 which commands the Government to legislate on:
  - Line (b) labeling of pesticides, paint and other toxic materials;
  - Line (c) chlorofluorocarbons (CFCs) and other aerosol components; and,
  - Line (e) determination of maximum limits for pollution by heavy metals such as mercury, cadmium, lead.

### **Protection of soil and subsoil – Law n.º 6/2016 as of 16 January, 2016**

The Government issued Decree-Law 6/2016 as of January 16<sup>th</sup>, 2016 which rules as *counterfeit* any fertilizer that contains toxic metals whose concentration is above the limits set by the ECOWAS <sup>12</sup>Commission. The limits for mercury are not set and should be considered by the authorities in future legislation.<sup>13</sup>

### **Waste Management**

Waste management in Cabo Verde is regulated by the following:

- General Waste Management Regime (GWMR)

Decree-Law n.º 56/2015 sets the legal regime for waste management. GWMR covers heavy metals under article 161.º on line b) which states that a regulation shall specify the methods to measure the presence of heavy metal in packaging. An Ordinance that will operationalize the provisions of the GWMR, containing technical provisions for waste disposal and elimination, packaging requirements (referred above), criteria for acceptance of waste in landfills is under discussion and is expected to be enacted as soon as its compliance with the Basel Convention is concluded. The GWMR also imposes the enactment of a National List of Hazardous Products which is being drafted by the MAE thru the National Agency for Water and Sanitation (ANAS).

The draft National List of Hazardous Products aims to allow for better waste management through standardization of classification of solid waste. The list will allow for more simplified data management of the production and disposal

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<sup>12</sup> Cabo Verde is a member of the Economic Community of West African States. In December 2012 ECOWAS adopted Regulation C/REG.13/12/12 on the control of the quality of fertilizers in the ECOWAS zone.

<sup>13</sup> Since Cabo Verde is a member to ECOWAS further national regulation is articulated with ECOWAS institutions.

of waste by all the waste-generating activities in Cabo Verde and provides a basis for the Waste Information System (SIRES) which is under development.

The draft National List of Hazardous Products is based on the European List of Waste and therefore will simplify the information exchange under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Certain solid waste categories are marked with a (\*) which classifies them as hazardous due to their origin, or characteristics such as flammability, corrosiveness, toxicity, and others, and thus represent increased risks to public health or the environment.

Under the category *Heavy Metals*, Article 3 of the draft National Waste List includes any mercury compound and mercury in metallic form when classified as hazardous substance. According to the Annex to the draft National Waste List, the classification of waste involves identification of the process or activity that generated it, its compounds and characteristics and the comparison of those to lists of waste and substances whose impact on health and environment is known.

The types of waste are defined through an assigned numerical code. Waste containing mercury is listed as hazardous under the following codes:

<b>Code</b>	<b>Description</b>
05 07 05 07 01*	Waste from purification and transport of natural gas containing mercury
06 04 04*	Waste containing mercury
06 07 03*	Mercury-containing barium sulfate sludge
10 14	Waste from crematoriums
10 14 01*	Waste from gas cleansing, containing mercury
16 01	Waste from vehicles
16 01 08*	Components containing mercury
16 03 07*	Metallic mercury
16 06 03*	Batteries containing mercury
17 09 01*	Waste from construction and demolition containing mercury

19 03 08*	Waste from partially stabilized mercury
20 01 21*	Fluorescent lamps or other waste containing mercury
20 01 35*	Electric and electronic equipment not covered by 20 01 21 or 20 01 23, containing hazardous components, such as accumulators and batteries covered by 16 06 and signaled as hazardous, mercury switches, etc.

- Strategic Plan for Waste Management (PENGER)

The Strategic Plan for Waste Management was approved thru Decree-Law n. 32/2016 as of April 21st, 2016 and provides for the construction of environmentally sound infrastructures at the state and municipal levels, the management of specific waste flows, and integrated system for waste management. The PENGER is the master plan for waste management in Cabo Verde, implemented by ANAS, and establishes rules for disposal and treatment targets. Unfortunately, the PENGER does not address mercury directly.

- Liquid Effluents

Waste water legislation is being drafted and could be modified in order to include the Convention obligations if deemed necessary. This will be reviewed and addressed by ANAS.

#### d) Gaseous Effluents

Air quality monitoring legislation was approved by Decree-Law n.º 5/2003. Article 7.º establishes that regulations should include a list of substances and toxic gases that are prohibited.

Any facility that may endanger the quality of the air as well as waste disposal is subject to licensing by the National Directorate of the Environment (DNA) under Article 8. nº 1. Licensing is only allowed to the facilities that possess state of the art techniques according to line (b) of Article 10. Article 16.º number 1,

line (a) and (b) determine that a joint Ordinance by the Ministers of Environment should set the limits for gases and lead. Nevertheless, this study did not include any parameters for mercury.

Overall, we conclude that this law needs further development to set the parameters including sampling methods in accordance to its articles (16.º, 17.º) to meet the obligations of the Minamata Convention.

### **Water and Sanitation Code- Legislative-Decree n.º 3/2015, as of Oct 19<sup>th</sup>, 2015**

The management of surface and groundwater and the exploitation of hydraulic structures are determined by the provisions of the Water and Sanitation Code (WSC), subject to compliance with international agreements. All water resources within the boundaries of Cabo Verde are considered a public good. As such, they are an integral part of the public domain of the State. Any operation on waters or water resources is subject to declaration or authorization under the laws and regulations in force.

The Water and Sanitation Code has a section which sets general provisions (that need to be further regulated) that cover water quality patterns including drinking water, water for agricultural purposes, waste water and bathing water. The first and the latter have already been regulated through other legal instruments (which we reference below). Water for agricultural purposes and waste water will need to be regulated as part of the ratification process of the Convention. The issuing authorities should be contacted in order to adjust the provisions to address the Convention obligations.

### **ORDINANCES**

There is a set of ordinances regulating mercury-added products, health aspects and wastes that are worth mentioning and are further detailed later in this study:

- Government Ordinance n.º 24/2009 as of 06 July 2009 sets the maximum level of metals (mercury included) allowed on fish for human consumption.
- Government Ordinance n.º 53/2011 as of 30 November 2011 regulates the classification of hospital waste and waste management procedures.

## **Convention Obligations and Cabo Verdean Laws**

### **ARTICLE 3: MERCURY SUPPLY SOURCES AND TRADE**

Article 3 focuses on limiting mercury supply and managing trade. It bans mercury mining for those sites not already mined and phases out existing mercury mines 15 years after entry into force of the Convention. There are five main sources of mercury supply: (1) primary mercury mining, (2) by-product mercury from mining other metals, (3) decommissioning chlor-alkali facilities, (4) recovery of mercury from wastes and used products that contain mercury, and (5) government or private mercury stocks (Lennett and Gutierrez 2014). Cabo Verde does not have any of the five main sources of mercury supply.

Cabo Verde is party to the Conventions that ban the import and export of chemicals and hazardous waste including the Basel Convention (transposed to the legal system through Resolution n.º 74/IV/94 as of 21 October 1994), the Rotterdam Convention (published in Decree n.º 17/2005 as of 26 December 2005) and the Stockholm Convention (approved through Decree n. 16/2005 as of 19 December 2005).

For the Basel Convention, there is a structure and a communication protocol established that assigns the DNA as the focal point for notifications and consent procedures; however, a law that densifies and institutionalizes these requirements it is not yet approved. Nevertheless, DNA is receiving requests under the convention and ensuring the prior informed consent procedure for the import and export of hazardous wastes.

In order to implement the Stockholm Convention, the Government approved Resolution n.º 18/2011 as of 24 May 2011 which establishes the PAN – POPs procedures. Steps are currently being undertaken in Cabo Verde to implement these regulations.

<b>Article 3 - Supply and Trade</b>	<b>Cabo Verde Domestic Law</b>	<b>Comments</b>
Not allow new primary mercury mining.	Not Applicable	
Phase out existing primary mercury mining within 15 years.	Not Applicable	
Prevent the import and use of mercury from primary mercury mining for ASGM.	Not Applicable	
In accordance with Article 3.5 (b), restrict the import and use of excess mercury from decommissioning chlor-alkali plants, and require environmentally sound disposal.	Not Applicable	See discussion above.
Obtain information on stocks of mercury or mercury compounds exceeding 50 metric tons (MT), and mercury supply generating stocks exceeding 10 MT/year.	Not Applicable	
Not allow the export of mercury unless the importing country provides written consent, the mercury is for an allowed use or environmentally sound storage, and all other conditions of Article 3.6 are met.	Cabo Verde is Party to the following Conventions: - Basel Convention Adopted through Resolution n.º 74/IV/94 as of 21 October 1994 - Stockholm Convention (Adopted through Decree- n. 16/2005 as of 19 December and implemented through the PAN – POPs approved by Government Resolution n.º 18/2011 as of 24 May 2011).	
Not allow the import of mercury without government consent,	Basel and Stockholm Conventions are in	

ensuring both the mercury source and proposed use are allowed under the Convention (and applicable domestic law).	force in Cabo Verde as well as Rotterdam Convention through Decree n.º 17/2005 as of 26 December 2005).	
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**ARTICLE 4: MERCURY-ADDED PRODUCTS**

Article 4 mandates the phasing out of the manufacture, import and export of products listed in Annex A, Part I and II of the Convention and regulates processes listed in Part II of Annex B. The phase out, for the most part, is to be effective after 2020. The Convention will reduce mercury demand in products through a combination of measures including (1) phase out mercury uses in many key products, (2) phase down mercury use in others, (3) require the review of some products for possible restrictions within five years, and (4) discourage the manufacture of new products using mercury (Lennett and Gutierrez 2014).

Cabo Verde does not manufacture mercury-added products, but it imports, uses and discards many of these products. Mercury-added products include batteries, switches and relays, compact fluorescent lamps (CFL), linear fluorescent lamps (LFL), high pressure mercury vapor lamps (HPMV), cold cathode lamps (CCFL) and electronic electrode fluorescent lamps (EEFL), cosmetics with mercury content above 1.0 ppm, pesticides, biocides, topical antiseptics, and non-electronic measuring devices such as barometers, hygrometers, manometers, thermometers, and sphygmomanometers.

Article 4 also covers measures to phase down the use of dental amalgams. Identifying the use and prevalence of mercury dental amalgams and setting national objectives in Cabo Verde will be determined through the Minamata Initial Assessment process.

The difficulties and constraints within this article is the fluidity of borders with neighboring countries, especially areas with few customs agents, where the control and monitoring of products with mercury will be challenging.

<b>Article 4 - Mercury Added Products</b>	<b>Cabo Verde Domestic Laws</b>	<b>Comments</b>
<p>Not allow the manufacture, import, and export of products listed in Part I of Annex A not otherwise excluded following the phase out date listed in the Annex.</p>	<p>a) Cosmetics Decree-Law 21/2015 as of March 31st, 2015 – cosmetic products regime. ARFA’s Board of Directors Deliberation number 12/2016 as of February 24<sup>th</sup> on the Communication procedure and placement on the market of cosmetic products.</p> <p>b) Pesticides, biocides and antiseptics - Pesticides Cabo Verde is due to conform its regulations to the Common Pesticide Regulation at the CILSS Level (ECOWAS). The PAN – POPs approved by Government Resolution n.º 18/2011 as of 24 May 2011. - Biocides Draft legislation was subject to discussion in October 2017 and now under evaluation by the National Pesticide Management Committee. - Antiseptics Antiseptics are subject to a commercialization authorization regulated on Decree-Law 59/2006 and may be further detailed (banned) on Decree-Law n.º 33/2009,</p>	<p>a) See discussion below.</p> <p>b) See discussion below.</p> <p>c) No legal provisions were found in the legal review.</p>

	21-09, which regulates antiseptics on Annex I.  c) Certain non-electronic measuring devices: barometers; hygrometers; manometers; thermometers; sphygmomanometers.	
Phase down the use of dental amalgam through two or more measures listed in Part II of Annex A.	No legal provisions were found in the legal review.	d) See comments below.
Take measures to prevent the incorporation of products listed in Part I of Annex A (i.e., switches and relays, batteries) into larger, assembled products.	No legal provisions were found in the legal review.	
Discourage the manufacture and distribution of new mercury product types.	No specific Law covers this issue.	

**a) Cosmetics (with mercury content above 1ppm), including skin lightening soaps and creams.**

Decree-Law 21/2015 as of March 31, 2015 regulates the Cosmetic Products Legal Regime (CPLR) including storage, commercialization, production, and labeling of cosmetics. Article 4, paragraph 5, prohibits making available on the national market any cosmetic product whose use has been restricted in any foreign markets due to human health or environmental protection concerns.

The Regulatory Agency for Pharmaceutical Products and Food (ARFA) is responsible for regulating cosmetic products to ensure conformity with the CPLR. The importer or the local producer is responsible making cosmetics available in the national market. As a responsible party, the importer or producer has several obligations under Article 5, paragraph 5 of the CPLR, most importantly to communicate the production and import of any cosmetic products. The procedures for communication and placement of cosmetics in the market, as well as the list of categories of cosmetic products, are described on

ARFA's Board of Directors Deliberations number 12/2016 and 13/2016 as of February 24th, 2016.

ARFA's Board of Directors Deliberation number 12/2016 establishes the procedure for communication and selling of cosmetics in the national market, regulates production, import, distribution, registration and notification of any undesirable effects or quality issues.

Article 6 of the CPLR is especially relevant as it requires the presentation by the importer of a registration record issued by ARFA. Without such a record, the General Directorate of Customs cannot allow the import and distribution of the products. The ability to sell products in the national market is always subject to registration at ARFA. Importers must provide a form to the ARFA that includes the category of the product, a photograph of the packaging and the country of origin.

ARFA's Board of Directors Deliberation number 13/2016 as of February 24th, 2016 approves the list of categories of cosmetic products in accordance with Article 8, paragraph 2, of the CPLR including skin products, hair, nails and body hygiene products. Notably, paragraphs (b) and (c) of Article 1 of the Deliberation 13/2016 includes mercury and its salts in the list of substances that are prohibited in cosmetic products (Annex II). It is banned regardless of the amount except in "special cases mentioned in other substances list". That said, this study concludes there are no exceptions in this case. The full list is accessible online at ARFA's website. Hence, the obligations set forth in Annex A Part I of the Convention is addressed in Cabo Verde in this instance.

#### **b) Pesticides, biocides and topical antiseptics**

Cabo Verde became a Party to the Rotterdam Convention through Decree n.º 17/2005 as of 26 December 2005. The objective of the Rotterdam Convention is

to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment and to contribute to their environmentally sound use, by facilitating information exchange about their characteristics, providing for a national decision-making process on their import and export.

The Rotterdam Convention (RC) covers pesticides and industrial chemicals. The two main Cabo Verdean national authorities responsible for the administrative functions required by the RC are the General Directorate of Agriculture, Forestry and Livestock (DGASP) and the National Directorate for the Environment (DWA). Please note that Cabo Verde is due to conform its regulations to the ECOWAS Common Pesticide Regulation at the CILSS Level. Regarding biocides, there is currently a legal gap in Cabo Verde in relation to placing biocidal products in the market. The commercialization of products which may have harmful effects on humans, animals and the environment and may also defraud users' expectations is not adequately being regulated. As such, in order to address this issue, draft legislation on biocidal products was issued by Cabo Verdean authorities and submitted to public consultation in October of 2017. The draft legislation is still under evaluation by the National Pesticide Management Committee and awaiting approval and enactment.

The draft legislation aims at the following objectives: (i) establishing a protocol that sets the basis for regulation of biocidal products from the time they are placed on the market until their use; (ii) clarifying responsibilities for the various types of biocidal products; (iii) establishing the rules and requirements for the authorization to sell biocidal products and its active substances in the market; (iv) establishing the criteria for classification, labeling and packaging of biocidal products intended to be made available on the national market; (v) defining the criteria for renewal, revocation, amendment and revision of authorizations; (vi) establishing the obligation to notify users of the unforeseen or adverse effects caused by biocidal products and identifying situations

requiring the withdrawal of biocidal products from the market; (vii) defining responsibilities for monitoring and compliance with legal provisions on biocidal products; and, (viii) classifying administrative offenses punishable with fines for violations of the regulations of that law.

According to the draft of the biocide protocol, the placing on the market of biocidal products is subject to authorization by ARFA. The criteria are subject to further regulation for each type of product and according to article 11, paragraph 1, line (b) of the draft legislation biocidal products may only be authorized if:

- (i) The biocidal product is effective;
- (ii) The biocidal product and its waste do not have unacceptable adverse impacts, in the short or long term, on human or animal health through consumption of drinking water, food products or air emissions;
- (iii) The biocidal product or its waste do not have unacceptable effects on the environment namely;
  - through its destination or distribution chain;
  - considering the possible long-distance transportation/dispersion to places far from its place of use through water (superficial, ground-water, drinking water), air and soil;
  - the unintended impact on organisms; and,
  - the impact on biodiversity and the ecosystem.

Antiseptics are regulated under Decree-Law 59/2006 as of December 26th, 2006 with additional regulations determined by Decree-Law n.º 22/2013 as of May 31st, 2013. These laws regulate that the conditions for the commercialization of antiseptics is subject to an authorization by ARFA. There is a list of national medicines approved by Decree-Law n.º 33/2009, 21-09, which is used by ARFA as a parameter for authorization and includes antiseptics on Annex I. According

to article 6 of Decree-Law n.º 33/2009, 21-09, only the listed antiseptics can be authorized on the market and any other products can only be introduced if deemed essential for a certain pathology or for investigation purposes. However, mercury compounds are not addressed in the list of antiseptics included in the legislation. The involvement of ARFA to regulate requirements under Minamata Convention is essential.

**c) Certain non-electronic measuring devices: barometers; hygrometers; manometers; thermometers; sphygmomanometers.**

No legal provisions addressing mercury in barometers, hygrometers, manometers, thermometers or sphygmomanometers were found in the legal review. Nevertheless, the National Institute of Quality Management and Intellectual Property (IGQP) was created through decree-Law n.º 35/2014 as of 5 December 2014, to be responsible for licensing all measuring devices in accordance with Decree-Law n.º 43/2015 as of 27 August, Ordinance n.º 53/2015 as of 30 October. The IGQP is assisted by the IGAE and both institutions should be involved in updating regulations to address Article 4 of the Minamata Convention.

**d) Dental Amalgam**

Article 4, paragraph 3, and Annex A Part II of the Convention outlines a list of measures to be taken by a Party to phase down the use of dental amalgam, taking into account the Party's domestic circumstances and relevant international guidance, including:

- Prevention and health promotion, thereby minimizing the need for dental restoration;
- Setting national objectives aiming at minimizing its use;

- Promoting the use of cost-effective and clinically effective mercury-free alternatives for dental restoration;
- Encouraging representative professional organizations to use mercury-free dental restoration alternatives; and,
- Promoting the use of best environmental practices in dental facilities to reduce releases of mercury and mercury compounds to water and land.

Ordinance n.º 34/2006 as of 18 December 2016 addresses subsidies granted by the National Institute of Social Security (INPS). INPS covers up to 60% of the cost of dental restoration for insured parties. However, the Ordinance allows for restoration with resins and amalgams but does not subsidize for mercury-free alternatives.

Assessment is necessary to evaluate the use of dental amalgams by dentistry practitioners and determine national phase down measures. Interim steps can be enacted to protect children, such as limiting or prohibiting the use of dental amalgam on children and mandating mercury-free alternatives. The Ministry of Health will be a key stakeholder in the development of the appropriate policy for Cabo Verde.

#### **ARTICLE 5: MANUFACTURING PROCESSES THAT USE MERCURY OR MERCURY COMPOUNDS**

This article covers two primary manufacturing processes that consume a large quantity of mercury: (1) in the production of chlorine and caustic soda at mercury-cell chlor-alkali plants and (2) in the production of vinyl chloride monomers. Other uses include sodium or potassium methylate or ethylate as catalysts in the manufacture of biodiesels and polyurethane elastomer applications that require a mercury catalyst. In Cabo Verde, there are no known existing industries that add mercury as part of manufacturing. Therefore, the obligations under this article are not immediately applicable to Cabo Verde.

<b>Article 5 - Manufacturing Processes</b>	<b>Cabo Verde Domestic Law</b>	<b>Comments</b>
Not allow the use of mercury or mercury compounds in the manufacturing processes listed in Part I of Annex B.	Not applicable	See discussion above.
Restrict (as specified in the Annex) the use of mercury in the processes listed in Part II of Annex B.	Not applicable	
Not allow new facilities from using mercury in the processes listed in Annex B, except facilities using mercury catalysts to produce polyurethane.	Not applicable	
For facilities with processes listed in Annex B, identify and obtain information on mercury or mercury compound use; and control mercury emissions to air, and releases to land and water.	Not applicable	
Discourage new uses of mercury in industrial processes.	Not applicable	

## **ARTICLE 7: ARTISANAL AND SMALL-SCALE MINING**

Article 7 addresses ASGM where mercury is used to extract gold. Artisanal and small-scale gold mining is defined as “gold mining conducted by individual miners or small enterprises with limited capital investment and production”. Artisanal and small-scale gold mining is the largest user and emitter of mercury in the world (Lennett and Gutierrez 2014). There is no ASGM activity in Cabo Verde therefore the obligations of this Article are not applicable.

<b>Article 7 - ASGM</b>	<b>Cabo Verde Domestic Law</b>	<b>Comments</b>
For All Governments		
Take measures to reduce, and where feasible, eliminate mercury and mercury compound use, emissions (to air), and releases (to land and water) associated with ASGM.	Not applicable	

For governments where ASGM and mercury use is “more than insignificant”.	Not applicable	
Establish coordinating mechanism and delineate agency roles for development/implementation of an ASGM National Action Plan (NAP).	Not applicable	
Define and formalize or regulate ASGM consistent with the Convention.	Not applicable	
Eliminate whole ore amalgamation, open burning of amalgam or processed amalgam, burning of amalgam in residential areas, and cyanide leaching of mercury-laden sediment, ore or tailings (the “worst practices”).	Not applicable	
Set mercury use reduction goals or targets consistent with the timely elimination of the worst practices and other use reduction efforts.	Not applicable	
Reduce mercury emissions, releases, and exposures associated with ASGM, and prevent mercury exposures of vulnerable populations (particularly women of child-bearing age and children).	Not applicable	
Prevent the diversion of mercury and mercury compounds from other sectors to ASGM and manage mercury trade consistent with the NAP.	Not applicable	
Implement a public health strategy to address mercury exposures to ASGM miners and communities.	Not applicable	

## ARTICLE 8: EMISSIONS

Article 8 regulates the emission of mercury and mercury compounds to the atmosphere. Member states have to control and where feasible reduce emissions from processes listed in Annex D. The five primary source categories are: (1)

coal fired power plants, (2) coal-fired industrial boilers, (3) smelting and roasting processes in the production of non-ferrous metals (e.g., lead, zinc, copper and industrial gold), (4) waste incineration facilities, and (5) cement production facilities. Waste incineration facilities include incinerators burning hazardous waste, municipal waste, medical waste, or sewage sludge; cement production sources cover the co-burning of wastes as well (Lennett and Gutierrez 2014). Hospitals in Cabo Verde do incinerate medical waste, although most times the incinerators are not operational, so this will need to be addressed as part of the Convention obligations.

For existing sources, a government may choose among five options to control mercury emissions. They are: (1) develop a quantified goal for controlling and reducing emissions from relevant sources, (2) identify emission limit values for controlling and reducing emissions from relevant sources, (3) use the best available techniques and best environmental practices to control emissions from relevant sources, (4) generate a multi-pollutant control strategy that would deliver co-benefits for control of mercury emissions and (5) identify alternative measures to reduce emissions from relevant sources (Lennett and Gutierrez 2014).

<b>Article 8 - Air Emissions</b>	<b>Cabo Verde Domestic Law</b>	<b>Comments</b>
Require best available techniques/best environmental practices (BAT/BEP) or associated emission limit values (ELVs) for new (as defined in Article 8.2(c)) sources listed in Annex D.	May be regulated under Decree-Law n.º 5/2003 as of 31 March 2003 – Regulates the National System for air protection control.	See discussion below.
Require one or more measures identified in Article 8.5 to control/reduce mercury emissions from existing sources listed in Annex D, which shall be operational at the source within 10 years.	May be regulated under Decree-Law n.º 5/2003 as of 31 March 2003 – Regulates the National System for air protection control.	
Require monitoring/reporting and otherwise establish a mercury emissions inventory for sources listed in Annex D.	May be regulated under Decree-Law n.º 5/2003 as of 31 March 2003 – Regulates the National System for air protection control.	

Cabo Verde derives its energy demands from oil, solar, wind and thermal sources. Petroleum is imported into the country - there is not oil or gas production where by-product mercury can be generated. However, as previously mentioned, Cabo Verde does incinerate medical waste, so authorities will need to be determine the path forward for controlling mercury emissions as part of the ratification process.

Cabo Verde has legislation concerning air emissions, namely Decree-Law n.º 5/2003 as of 31 March 2003 that establishes the National Air Quality Monitoring and Protection System, however this does not include limits values for mercury. The legal and technical regulation of waste incineration is still under evaluation and monitoring falls under the responsibility of ANAS and DNA.

## Article 9: Releases to Land and Water

This Article addresses identifying and reducing releases of mercury and mercury compounds to land and water from the relevant point sources not addressed in other provisions of this Convention. Parties must identify significant point sources of mercury releases. There are four control measures that must be taken for the release of mercury to land and water and they include: (1) define release limit values; (2) use BAT and BET; (3) identify a multi-pollutant strategy that will deliver co-benefits for control of mercury releases; and, (4) identify alternative measures to reduce releases from relevant sources (Lennett and Gutierrez 2014).

In Cabo Verde, the release of mercury and mercury compounds to land and water is being quantified through the Minamata Initial Assessment process. In response, the government of Cabo Verde will need to decide whether to prepare an optional plan that would establish expected targets, goals, and outcomes.

<b>Article 9 - Releases</b>	<b>Cabo Verde Domestic Law</b>	<b>Comments</b>
Require reporting or otherwise obtain information as needed to identify significant sources of mercury/mercury compound releases to land or water, and to maintain an inventory of releases from the sources identified.	It could be regulated under the draft of Wastewater Regulating Decree which is under discussion and expected to be finalized in 2018. Water and Sanitation Code regulates wastewater quality in general.	No law covers this issue per se, but identification can occur through the application of water, soil control legislation provided that the parameter is set. The WSC, in particular, will need to be further defined as part of ratification process.
Take one or more measures specified in Article 9.5 to control/reduce mercury and mercury compound releases to land and water from significant sources it identifies.	Unlikely to apply to Cabo Verde.	

This Article could potentially be regulated under the draft of the Wastewater Regulating Decree which is currently under discussion. It will be prudent for Cabo Verde to include mercury releases as part of this Decree. The Minamata Initial Assessment process is expected to facilitate the identification and quantification of potential sources of mercury released in Cabo Verde and thereby help establish national priorities.

#### **Waste Water**

The MAE through ANAS is preparing along with other stakeholders the enactment of the Waste Water Regulating Decree which aims to establish waste water regulations that will set the monitoring standards in accordance with the WSC. There is a need for Cabo Verde to address mercury as part of the drafting of these waste water regulations.

#### **Quality of soils**

The quality of the soils is analyzed by DNA and INIDA. This study did not find any parameters for mercury. It will be prudent for Cabo Verde to address this gap as part of the ratification process.

#### **Medical waste**

Medical waste falls under the governance of GRWM. Government Ordinance n.º 53/2011 as of 30 November 2011 regulates the classification of hospital waste and management procedures. However, no provisions were found to address mercury control. The treatment and disposal of medical waste containing mercury will need to be addressed jointly with hazardous waste.

### **ARTICLE 10. ENVIRONMENTALLY SOUND INTERIM STORAGE OF MERCURY**

Article 10 covers mercury, as a product or non-waste, and requires parties to ensure that these classes of mercury are placed in environmentally sound storage. Environmentally sound storage guidelines are currently being developed by the Conference of Parties.

<b>Article 10 – Interim Storage</b>	<b>Cabo Verde</b>	<b>Comments</b>
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	<b>Domestic Law</b>	
Take measures to ensure interim mercury storage is conducted in an environmentally sound manner, taking into account guidelines to be developed by the Conference of the Parties (COP).	No text covers this issue.	See comments below.

Despite the fact that there is no specific provision addressing this Article, the Strategic Plan for Waste Management (PENGER) may provide the basis for elaborating on environmentally sound storage in Cabo Verde.

### **ARTICLE 11: MERCURY WASTES**

This article addresses the definition of mercury wastes, as well as treatment of waste; including taking measures to manage mercury waste in an environmentally sound manner. The definition of mercury wastes is the substances or objects consisting, containing, or contaminated with mercury or mercury compounds in a quantity above the relevant thresholds that are: (1) disposed of, (2) intended to be disposed of, or (3) required to be disposed of by the provisions of national law or Article 11 (Lennett and Gutierrez 2014).

<b>Article 11 – Mercury Waste Management</b>	<b>Cabo Verde Domestic Law</b>	<b>Comments</b>
Use a definition of mercury waste consistent with Article 11.2.	Currently regulated under Decree-Law 56/2015 as of 17 October 2015 which establishes the Waste Prevention and Management Law.	See discussion below.
Take measures to manage mercury wastes in an environmentally sound manner, taking into account guidelines developed under the Basel Convention and in accordance with COP requirements to be developed.	Cabo Verde is a Party to the Basel Convention.	
Take measures to restrict mercury derived from the treatment or re-use of mercury waste to allowed uses under the Convention or environmentally sound disposal.	PENGER, Decree-Law 32/2016 as of 21 April 2016	
Require transport across international boundaries in accordance with the Basel Convention, or if the Basel Convention does not apply, consistent with international rules, standards, and guidelines.	Cabo Verde is a Party to the Basel Convention.	

Cabo Verde has general disposal provisions contained on Decree-Law 56/2015 as of 17 October 2015 which establishes the Waste Prevention and Management Law. Concerning Article 11.2, in collaboration between ANAS and DNA, the regulation determining the National List of Hazardous Waste is being prepared for enactment in accordance with recently adopted Basel Convention Technical Guidelines for the ESM of waste consisting of, containing or contaminated with mercury or mercury compounds. It is important to note that Cabo Verde is a signatory of the Basel Convention and the convention’s requirements were incorporated in the country’s legislation and published on the Official Bulletin on October 21st, 1994.

As for the treatment of solid waste, the Penger, Decree-Law 32/2016 as of 21 April 2016 outlines steps to create safe and state of the art facilities and procedures to deal with waste. For example, waste dumps are being replaced with sanitary landfills. Nevertheless, there is no regulation dealing with mercury waste and this will need to be addressed to reflect both Minamata and Basel requirements.

## **ARTICLE 12: CONTAMINATED SITES**

Under this Article, each Party shall endeavor to develop appropriate strategies for identifying and assessing sites contaminated by mercury or mercury compounds. The Conference of the Parties shall adopt guidance on managing contaminated sites that may include methods and approaches for:

- (a) Site identification and characterization;
- (b) Engaging the public;
- (c) Human health and environmental risk assessments;
- (d) Options for managing the risks posed by contaminated sites;
- (e) Evaluation of benefits and costs; and,
- (f) Validation of outcomes.

<b>Article 12 – Contaminated Sites</b>	<b>Cabo Verde Domestic Law</b>	<b>Comments</b>
Develop strategies for identifying and assessing mercury/mercury compound contaminated sites.	No text covers this issue.	See discussion below.
If risk reduction activities are taken at contaminated sites, they are taken in an environmentally sound manner, incorporating risk assessment where appropriate.	No text covers this issue.	See discussion below.

Article 12 of the Convention calls for the creation and adoption of guidelines in approaching contaminated sites. There are no mandatory obligations for cleanup. Cabo Verde has the option to create legislation on this matter or wait for further initiatives from the COP. However, proper identification of contaminated sites is

recommended. The DNA is the institution that has jurisdiction in the coordination of this task according to the MAE by laws.

### **ARTICLE 13: FINANCIAL RESOURCES AND MECHANISMS**

Each Party is expected to provide, within its capabilities, resources in respect of those national activities that are intended to implement this Convention, in accordance with its national policies, priorities, plans and programs. Such resources may include domestic funding through relevant policies, development strategies and national budgets, and bilateral and multilateral funding, as well as private sector involvement.

Capacity- building and technology transfer, are encouraged, on an urgent basis, to enhance and increase their activities on mercury in support of developing country Parties in the implementation of this Convention relating to financial resources,

<b>Article 13 – Financial Resources</b>	<b>Cabo Verde Domestic Law</b>
Access domestic resources as may be needed to implement Convention obligations.	See discussion below.
Access financial resources available under the Convention financial mechanism and other resources available from multilateral, regional, and bilateral funding sources.	See discussion below.

technical assistance and technology transfer.

These requirements of this Article may be addressed in Cabo Verde through different sources of funding, whether national (e.g., National Budget and Environment Fund) and international funding (grants and loans through multilateral cooperation since Cabo Verde has several multilateral partners).

The National Budget contemplates projects every year for each Ministerial Cabinet. If the actions needed to implement the Minamata Convention fall under a specific project (this should be determined on the previous year through negotiation

between the Minister for the Environment and his peers, namely the Minister of Finance), the implementing entity (DNA and the MAE) may preview the needed budget for the action and require funding through the National Budget.

If other stakeholders have planned actions under the Minamata Convention, they can negotiate as well with the Ministry of Finance through the respective Ministerial Cabinet in order to allocate funds for the next year. This is a political process that must abide by Law n.º 78/V/98 as of December 7<sup>th</sup>, 1998 altered by Law n.º5/VIII/2011 which approves the rules for the approval of the National Budget.

There is also a Fund on Environment approved by Regulating-Decree n.º 3/2012 as of 28 February 2012 that may address these issues. The Environment Fund is financed through the “ecological tax” created through Law 76/VII/2010 as of 23 August 2010 and indices on packing (articles 2.º, 3.º and 7.º, 8.º of the Law). The ecological tax funds are destined to sanitation and environment protection actions according to Law 76/VII/2010 and its resources are managed by the State (which receives 40% of the total tax collection) and the municipalities (who receive 60%). Article 3.º of Regulating-Decree n.º 3/2012 rules that projects included on the National Budget (Pluri-annual Public Investment Plan – PIP) as well as projects presented by the private sector may be eligible for funding under the Environment Fund. The projects must fall under certain categories, notably; (i) waste management; (ii) environment information to the public; (iii) protection of the environment; and, (iv) implementation of the environment policy.

As previously described, there are existing mechanisms in Cabo Verde that may provide sources of funding for Minamata-related activities.

## ARTICLE 16: HEALTH ASPECTS

Article 16 focuses on health ministries by providing guidance on the activities the ministries can undertake to minimize the exposure of their population to mercury.

Article 16 – Public Health	Cabo Verde Domestic Law	Comments
<p>Promote the development and implementation of strategies to identify and protect populations at risk, such as developing fish consumption guidelines.</p>	<p>Government Ordinance n.º 24/2009 as of 06 July 2009 sets the maximum level of mercury allowed in fish and other seafood for human consumption.</p> <ul style="list-style-type: none"> <li>- Drinking Water quality is regulated under the Water Code Decree-Law n.º 3/2015 as of October 19, 2015 and Regulating-Decree n.º 5/2017.</li> <li>- No text covers this point concerning <i>bathing waters</i> but can be regulated under Decree-Law 30/2015 as of May 18<sup>th</sup>.</li> </ul>	<p>See discussion below.</p>
<p>Promote occupational exposure educational and prevention programs.</p>	<p>Decree-Law number 55/99, as of December 6 – On Health and safety on the working place.</p> <p>Legislative Decree number 5/2007, as of October 16<sup>th</sup> with the modifications introduced by Legislative Decree n.º 1/2016 – Labor Code</p>	<p>See discussion below.</p>
<p>Promote prevention, treatment, and</p>	<p>Basic Health Law, Law</p>	<p>See discussion below.</p>

care services for affected populations.	n.º 41/VI/2004 as of April 6 <sup>th</sup> .	
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As previously discussed, Government Ordinance n.º 24/2009 as of 06 July 2009 sets the maximum level of metals (mercury included) allowed in fish and other seafood for human consumption. Depending on the species, the amount ranges from 0.50 to 1 mg/kg.

The drinking water quality at the source (bored wells both desalt and freshwater) is monitored by ANAS in accordance with the WSC (approved by Decree-Law n.º 3/2015 as of October 19, 2015). In November 6<sup>th</sup>, 2017 the Government issued Regulating-Decree n.º 5/2017, which sets the criteria and rules that define the drinking water quality requirements. The parameters in this decree include the monitoring of the presence of pesticides (article 17.º and 18.º). General monitoring is done by ANAS in collaboration with health and sanitation authorities, depending on the source, namely ARFA, INIDA, DGS. Annex I, concerning toxic substances, sets the VP (parametric value) for pesticide control while Annex IV establishes the minimal frequency for sampling and analysis. According to Article 18, ANAS in collaboration with other stakeholders, establishes by June 30<sup>th</sup> each year, a list of pesticides to control during that year, along with the respective monitoring season according to the agricultural practices, timing and other factors. However, it is important to note that mercury has not been included in these parameters to date. Mercury monitoring should be included, as a parameter for quality, on the list and should be evaluated at regular intervals.

The MAE through ANAS is also preparing, along with other stakeholders, the enactment of the waste water regulations that will set the monitoring standards. Decree-Law 30/2015 as of 18 May 2015 sets specific standards for monitoring bathing water quality. Bathing waters are defined as the coastal waters where a great number of people bathe. No limits on mercury were found in this study so the authorities should consider the periodicity of the monitoring.

Legislative Decree number 5/2007, as of October 16th with the modifications introduced by Legislative Decree n.º 1/2016 – Labor Code, broadly addresses occupational health. Decree-Law number 55/99, as of December 6, 1999 sets the rules for health and safety in the work place which are monitored by General Labor Inspection (IGT). Health and safety rules impose the following obligations on the employer:

- to inform the worker of the risks of the function in terms of safety, health and environmental aspects (article 4, paragraph 1, line (c));
- to ensure that the facilities are clean and sanitary equipment ventilated (article 4, paragraph 1, line (e); article 15.º; and,
- provide without cost the safety equipment necessary for protecting the workers' health (article 4, paragraph 1, line (f), and article 62.º-71.º).

Additionally, Article 68.º imposes the obligation of the employer to provide sterilized protection masks that are adequate to the nature of the risk. Employers must promote (Article 75.º) medical exams for employees. The violation of these safety and health provisions is punished by law as a misdemeanor.

While regulations do exist to minimize exposure by the population to chemical hazards, there still is a need to elaborate health related regulation on mercury in Cabo Verde, especially in terms of promoting prevention, treatment, and care services for affected populations and occupational exposure and education.

#### **ARTICLE 17. INFORMATION EXCHANGE**

Article 17 focuses on the exchange of information between countries and identifies key information that need to be share among Parties. The article also identifies mechanisms for sharing the information covered under Article 17.

<b>Article 17 – Information Exchanges</b>	<b>Cabo Verde Domestic Law</b>	<b>Comments</b>
Collect and disseminate information	No text covers this	See comments below.

on annual quantities of mercury and mercury compounds emitted, released, or disposed; and other information specified in Article 18.	point.	
Share information on the health and safety of humans and the environment as non-confidential, in accordance with Article 17.5.	No text covers this point.	See comments below.
Report to the COP on progress in implementing Convention obligations under Article 21.	No text covers this point.	See comments below.

In this study, no legal provisions were found in Cabo Verdean domestic laws dealing with information exchange, although there is collection of data in sectors that might relate to mercury (wastes, pesticides, etc.). To help comply with Article 17 requirements, Cabo Verde will need to ensure that during its update of appropriate legislation and regulations on mercury that data on quantities of emissions, releases, and disposal are covered. Authorities should be encouraged to include mercury monitoring in fish and other environmental media.

#### **ARTICLE 18. PUBLIC INFORMATION, AWARENESS AND EDUCATION**

The available mechanisms to communicate with workers and share public information related to potential or actual risks related to production, importation, export, use and dumping of chemicals exist in Cabo Verde, as explained throughout this study.

The bylaws of many institutions, namely the Regulatory Agencies, impose the responsibility for provide training to the population in general. Nevertheless, a joint communication strategy among stakeholders including an articulation of legal duties is needed in the future to comply with Article 17. As mentioned previously in this study, there are funds available for public information. Cabo Verde will need to ensure a leading institution is charged for these purposes.

## **PARTICIPATION AS PARTY/ADMINISTRATIVE MATTERS: PATH TO RATIFICATION**

According to Article 12, paragraph 2, of the Cabo Verdean Constitution, international conventions, validly approved or ratified, will be in force in Cabo Verde after they are published on the Official Bulletin, entered into force on the international order, and as long as they bind the State of Cabo Verde internationally. Paragraph 4 of article 12 rules that once in force, international and internally, the principles and norms contained in international conventions that were validly approved or ratified prevail over all legal instruments of infra-constitutional hierarchic value. Furthermore, Article 13 of the Constitution rules that adherence to any legal convention must be previously approved by the Government or the Parliament in order to for the international convention to be in force.

Depending on the existence of a reserved competence on the matter ruled under the Convention (as explained previously in Introduction of this report), both the Parliament (Article 175. line g and 265.º paragraph 1 of the Constitution) and the Government have power to approve International Conventions. Once internally approved by the Parliament or the Government (Executive), conventions are then submitted for Presidential ratification under Articles 13 line (a) and 278º, paragraph 1 and 3 of the Constitution.

After receiving the Convention for ratification, the President of the Republic may:

- Submit it to the Constitutional court within 8 days from reception in case he determines any provision to be unconstitutional (article 278, paragraphs 1, line a) and paragraph 3, line (a). If the Court rules a Convention unconstitutional, the President must veto it based on legal obstacles and return it to the Government (Executive) to remove the unconstitutional provision or to the Parliament (who has to remove the unconstitutional norm or overrule the courts judgment by approving the

Convention with a 2/3 majority of the MP's (Article 279, paragraphs 1, 2 and 4).

- Ratify the Convention within 30 days of receiving it (according to Article 135, paragraph 1, lines of the constitution) if the President agrees with the content.
- Veto the Convention for political reasons within 30 days of receiving it (according to article 135, paragraph 1, lines of the constitution). If the President vetoes a Convention for political reasons, it is returned to the Government to reformulate under the sanction of inefficacy. The Parliament may overrule the presidential veto within 120 days from receiving it (according to article 137, paragraph 1, lines of the constitution) by approving the Convention with an absolute majority (more than half of the total number of parliamentarians, which accounts for 36/72 MP's currently). After the Convention is confirmed by the Parliament, the President of the Republic has eight days to ratify it.

## **Conclusions and Recommendations**

As part of the legislative gap analysis, the gaps between the Convention and national laws in Cabo Verde were examined. During the course of this review, the following conclusions were reached:

1. Within the context of Cabo Verde, some parts of the Convention are not immediately relevant to Cabo Verde and therefore do not need to be part of the countries priorities in addressing legal gaps. These include: supply/mining of mercury (Article 3); manufacturing processes that use mercury or mercury compounds (Article 5); ASGM (Article 7); and, most of the activities listed in Annex D.

2. The life cycle management of mercury-containing products presents a challenge in Cabo Verde. Cabo Verde is a net importer of MAPs, thus Articles 4, 10, and 11 are important obligations that will need to be addressed. There are a broad set of regulating authorities in Cabo Verde with competency regarding MAPs (namely in the field of biocides, pesticides, cosmetics, public health, water, and waste management). These institutions have experience in working together and have established committees dedicated to chemicals management. However, existing regulations will need to be bolstered to address the obligations of the Convention.
  
3. Overall, the review of legislation revealed that only a limited number of laws in Cabo Verde specifically address mercury and mercury-added products, with exception of regulations for cosmetics and fish consumption guidelines. However, a broad scope of laws and regulations exist in Cabo Verde that can provide the basic framework for the insertion of specific provisions to address the obligations of the Minamata Convention, notably:
  - **Basic Environment Law** which aims to promote overall environmental quality and sets general principles for protecting the quality of the air, water, flora, fauna, soil, and subsoil. It includes provisions that regulate the prevention of pollution derived from chemicals and sets forth the need for regular evaluation of the potential effects of chemicals on humans and the environment, control on the production and use and disposal of chemicals, and the promotion of information to the public. It also commands the Government to legislate on maximum limits for pollution by heavy metals.
  
  - **Water and Sanitation Code** includes a section that sets general provisions that cover water quality including drinking water, water for agricultural purposes, waste water and bathing water. Water for

agriculture purposes and waste water will need to be further regulated as part of the ratification process. In addition, the **Strategic Plan for Waste Management (PENGER)** provides for the following: construction of environmentally sound infrastructures at the state and municipal levels, the management of specific waste flows, and an integrated system for waste management. PENGER provides the masterplan for waste management in Cabo Verde but will need to be updated to address mercury.

- **Decree-Law n. 5.2003** establishes a National Air Quality and Monitoring Systems but will need further bolstering to meet the obligations of Article 8.
  - Additionally, legislation is being drafted to address biocides, waste management facilities, and to establish a National List of Hazardous Products that is aimed at allowing for better waste management through standardization of classification of solid waste.
4. Cabo Verde is a small country with a structured regulatory framework in place. The country is a Party to the Basel, Rotterdam and Stockholm Conventions and the regulations already in place for these Conventions will prove to be an advantage for the implementation of the Minamata Convention.
5. The legal analysis identified the following gaps and challenges in order for Cabo Verde to comply with the Convention obligations:
- Cabo Verde has not ratified the Convention but is taking steps toward ratification, namely by conducting a Minamata Initial Assessment to determine the extent and sources of mercury pollution in the country. The completion of the Minamata Initial Assessment in Cabo Verde helped

quantify the key sources of mercury in the country and will help set national priorities to meet the obligations of the Convention.

- As a net importer of MAPs, Cabo Verde needs to strengthen its current laws in this area.
- A leading institution for the implementation of the Minamata Convention will need to be identified.
- The lack of specific provisions and existing regulations pertaining to mercury and thereby low awareness by the key stakeholders and the population about the need to regulate mercury will need to be addressed.
- Regulations covering solid waste do not currently include mercury waste storage and disposal.
- Dental amalgam is still allowed on the legislation for dental restoration subsidies (Ordinance n.º 34/2006 as of 18 December 2006).

With regard to the above, some actions and next steps are recommended:

- To facilitate activities relating to mercury, a national coordinating entity should be identified through a legal instrument such as a joint Ordinance by relevant Ministries to start preparing for the ratification of the Convention.
- A National Plan for the implementation of the provisions of the Minamata Convention is strongly recommended.
- Article 4 (MAPs): As a net importer of MAPs, Cabo Verde needs to bolster and add new legislation for MAPs, incorporating the applicable mandated phase outs and addressing legislation on non-electronic measuring

devises. The draft legislation on biocides needs to be updated to include mercury and thresholds need to be established for monitoring mercury in fertilizers and pesticides. In the new MAP legislation, Cabo Verde will need to elaborate on dental amalgam phase down measures as a minimum requirement of the convention. A specific provision banning the use of dental amalgams is recommended as it is still allowed in existing regulation and subsidized along with other mercury-free dental restoration techniques.

- In order to ensure an integrated approach to activities related to MAPs, a Legal Planning and Political Directive should be developed to harmonize all relevant legislation and the responsibilities of relevant institutions concerning the use and disposal of mercury added products.
- Article 5 (Manufacturing Process): It is worth recommending that even with the absence of industries or processes that use mercury, Cabo Verde can take a preventative measure by including legislation or rules that prohibit these mercury processes or industries from taking root in Cabo Verde. Further, it would be prudent for Cabo Verde to ratify the Basel Ban Amendment which prohibits developing countries from exporting their toxic wastes, including mercury wastes, to Cabo Verde, whether for disposal or recycling. The Basel Ban Amendment creates another layer of protection against toxic waste dumping and places the onus on developed countries to monitor and prevent toxic waste exports to Cabo Verde.
- Article 8 (Emissions) - Cabo Verde will need to determine a path forward for controlling mercury emissions within the parameters of the Convention. It would be prudent to set limits in order to measure mercury and monitor emissions from existing incineration facilities such as hospitals.

- Article 9 (Releases): It will be prudent for Cabo Verde to further specify its approach to releases under the Convention. Reflection should be made by the authorities regarding the need to issue legislation regarding procedures for regular mercury monitoring.
- Article 10 (Storage): Cabo Verdean authorities should monitor the Minamata Convention efforts in developing environmentally sound storage guidance, especially concerning MAPs.
- Article 11 (Mercury Wastes): No legal provisions currently addresses the environmentally sound management of mercury waste. A National Implementation Plan is recommended and should include methods for mercury waste management. Laws concerning disposal and management of waste derived from MAP (notably lamps and non-electronic devices) are strongly recommended. Legislation should ensure compliance with the Basel Convention Technical Guidelines for the ESM waste consisting of, containing, or contaminated with mercury or mercury compounds.

## **Institutional Gap Analysis**

In Cabo Verde, no one institution exists to monitor mercury import, use and disposal in the country. The Convention proposes regulating mercury sources and supplies, mercury added products, mercury wastes and contaminated sites. It also proposes to undertake a national inventory of mercury release, and to develop mechanisms that educate and inform the public and monitor the release of mercury.

In order to thoroughly address these issues, the discussion of the Institutional Gap Analysis and Capacity Barriers for Cabo Verde is organized around each article in the Minamata Convention on Mercury. The Minamata Focal Point for the Ministry of Agriculture and Environment and the National Project Coordinator for the

Minamata Initial Assessment, representing the Cabo Verde government, identified the principal uses, stakeholders and priority level of the article-specific problem associated with mercury in this analysis (see each table under all articles).

### **ARTICLE 3: MERCURY SUPPLY SOURCES AND TRADE**

Article 3 focuses on limiting mercury supply and trade. It bans mercury mining for those sites not already mined and phases-out existing mercury mines 15 years after entry into force of the convention. There are five main sources of mercury supply: (1) primary mercury mining, (2) by-product mercury from mining other metals, (3) decommissioning chlor-alkali facilities, (4) recovery of mercury from wastes and used products that contain mercury, and (5) government or private mercury stocks (Lennett and Gutierrez 2014). Cabo Verde is not conducting activities that involve any of these five main sources.

<b>Article 3- Mercury supply sources and trade</b>		
<b>Principal Uses</b>	<b>Stakeholders (see page 2 for full names)</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
<p>There is no specific legislative, regulatory and legal framework in Cape Verde for the management of the pollution generated by mercury. However, Decree Law 49/2016: establishes the structure, organization and operating rules of the Ministry of Agriculture and Environment. Through the National Directorate of Environment, environmental policies are managed: Environmental Laws (LEI No. 86 / IV / 93); And the Conventions: Part of the Basel Conventions on Transboundary Movement of Hazardous Wastes, Stockholm Convention on POPs, Stockholm Convention on Pesticides, Montreal Protocol</p> <p>(Decree-law nº56/2015) defines the principles for waste mangament including</p>	<p>DNA ANAS DNS INSP Municipalities (Association) DGA. Enapor MAE</p>	<p>MEDIUM - HIGH</p>

hazardous wastes		
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#### **ARTICLE 4: MERCURY ADDED PRODUCTS**

This article bans the import and export of *products* listed in Annex A Part I and II of the Convention and regulates *processes* listed in Part II of Annex B. The ban is to be effective after the phase-out date, which is the year 2020. The Convention will reduce mercury demand in products through a combination of measures, which (1) phase out mercury uses in many key products, (2) phase down mercury use in others (3) require the review of some products for possible restrictions within five years, and (4) discourage the manufacture of new products using mercury (Lennett and Gutierrez 2014).

Mercury-added products includes batteries, switches and relays, compact fluorescent lamps (CFL), linear fluorescent lamps (LFL), high pressure mercury vapor lamps (HPMV), cold cathode lamps (CCFL) and electronic electrode fluorescent lamps (EEFL) and cosmetics with mercury content above 1.0 ppm, Pesticides, biocides and topical antiseptics and in non-electronic measuring devices such as barometers, hygrometers, manometers, thermometers, and sphygmomanometers. While Cabo Verde does not manufacture mercury-added products, it does import, use and discard many of these products.

In addition to the product phase-out, reductions, or alternative suggestions, Article 4 also covers measures to phase down the use of dental amalgams. Identifying the use and prevalence of mercury dental amalgams and setting national objectives in Cabo Verde will be determined through the MIA process.

The difficulties and constraints within this article is the fluidity of borders with neighboring countries, especially areas with few customs agents, where the control and monitoring of products with mercury will be challenging.

<b>Article 4 - Mercury-added products</b>
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<b>Principal Uses</b>	<b>Stakeholders (see page 2 for full names)</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
Cabo Verde does not manufacture mercury-added products but does import these products.	MAE DNA ANAS INSP Delegações DGDR DGA Enapor	HIGH

## **ARTICLE 5: MANUFACTURING PROCESSES**

This article exempts manufacturing processes that uses mercury added products, as well as processes for manufacturing such mercury added products or processes that handle mercury containing waste. The two primary manufacturing processes that consume a large quantity of mercury are (1) in the production of chlorine and caustic soda at mercury-cell chlor-alkali plants and (2) in the production of vinyl chloride monomers. Other uses include sodium or potassium methyrate or ethylate as catalysts in the manufacture of biodiesels and polyurethane elastomer applications that require a mercury catalyst. In Cabo Verde, there are no known existing industries that add mercury as part of the manufacturing process.

<b>Article 5 - Manufacturing Processes in which mercury or mercury compounds are used</b>		
<b>Principal Uses</b>	<b>Stakeholders</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
Not addressed by Cabo Verde regulations since there is no existing industry using mercury in manufacturing.	DNA ANAS DNS INSP Municipalities (Association) DGA Enapor IGAI DGI	N/A

## ARTICLE 7: ARTISANAL AND SMALL-SCALE GOLD MINING

Article 7 addresses artisanal and small-scale gold mining (ASGM) where mercury is used to extract gold. ASGM is defined as “gold mining conducted by individual miners or small enterprises with limited capital investment and production”. ASGM is the largest use and emitter of mercury in the world (Lennett and Gutierrez 2014). There is no ASGM activity in Cabo Verde.

<b>Article 7 - Artisanal and small-scale gold mining</b>		
<b>Principal Uses</b>	<b>Stakeholders (see page 2 for full names)</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
ASGM does not exist in Cabo Verde	N/A	N/A

## ARTICLE 8: AIR EMISSIONS

Article 8 regulates the emission of mercury and mercury compounds to the atmosphere. Member states have to control and where feasible reduce emissions from processes listed in Annex D. The five primary source categories are: (1) coal fired power plants, (2) coal-fired industrial boilers, (3) smelting and roasting processes in the production of non-ferrous metals (e.g., lead, zinc, copper and industrial gold), (4) waste incineration facilities, and (5) cement production facilities. Waste incineration facilities include incinerators burning hazardous waste, municipal waste, medical waste, or sewage sludge; cement production sources cover the co-burning of wastes as well (Lennett and Gutierrez 2014). The five primary sources categories listed above do not exist in Cabo Verde.

For existing sources, a government may choose among five options to control mercury emissions. They are: (1) develop a quantified goal for controlling and reducing emissions from relevant sources, (2) identify emission limit values for controlling and reducing emissions from relevant sources, (3) use the best available techniques and best environmental practices to control emissions from relevant

sources, (4) generate a multi-pollutant control strategy that would deliver co-benefits for control of mercury emissions and (5) identify alternative measures to reduce emissions from relevant sources (Lennett and Gutierrez 2014).

<b>Article 8 - Air Emissions</b>		
<b>Principal Uses</b>	<b>Stakeholders (see page 2 for full names)</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
The five primary source categories for air emissions do not exist in Cabo Verde. Regulations do exist on air quality but need to be strengthened to improve air emissions control.	MAE DNA DNS INSP Municipalities (Association) DGI – General Direction of Industries (UniCV/UniPiaget)	MEDIUM

#### **ARTICLE 9: RELEASES TO LAND AND WATER**

This Article addresses identifying and reducing releases of mercury and mercury compounds to land and water from the relevant point sources not addressed in other provisions of this Convention. Parties must identify significant point sources of mercury releases. There are four control measures that must be taken for the release of mercury to land and water and they include: (1) define release limit values, (2) use BAT and BEP, (3) identify a multi-pollutant strategy that will deliver co-benefits for control of mercury releases and (4) identify alternative measures to reduce releases from relevant sources (Lennett and Gutierrez 2014).

In Cabo Verde, the release of mercury and mercury compounds to land and water is relatively unknown and undescribed. The MIA process helped facilitate the potential sources of mercury released. In response, the government of Cabo Verde will make a decision to prepare an optional plan that would establish expected targets, goals, and outcomes.

<b>Article 9 - Releases to Land and Water</b>		
<b>Principal Uses</b>	<b>Stakeholders (see page 2 for full names)</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
<p>The release of mercury and mercury compounds to land and water are relatively unknown and require assistance toward identification of potential source types and magnitude of releases.</p> <p>There are no existing regulations addressing the releases to land and water of mercury or any other hazardous substances.</p>	<p>DNA ANAS DNS INSP Municipalities (Association) DGA Enapor IGAI DGI – General Direction of Industries (UniCV/UniPiaget)</p>	<p>LOW - MEDIUM</p>

#### **ARTICLE 10: ENVIRONMENTALLY SOUND INTERIM STORAGE OF MERCURY**

Article 10 addresses ensuring interim mercury storage is conducted in an environmentally sound manner, taking into account guidelines to be developed by the Conference of the Parties (COP). In Cabo Verde, there are no government-sanctioned facilities or storage of mercury and/or mercury containing products.

<b>Article 10 - Environmentally Sound interim storage of mercury</b>		
<b>Principal Uses</b>	<b>Stakeholders (see page 2 for full names)</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
<p>There is no facility for interim storage of mercury.</p>	<p>Ministry of Agriculture and Environment DNA ANAS DNS INSP Municipalities (Association) DGA Enapor IGAI DGI – General Direction of Industries (UniCV/UniPiaget)</p>	<p>LOW - MEDIUM</p>

## ARTICLE 11: MERCURY WASTE MANAGEMENT

This article addresses the definition of mercury wastes, as well as treatment of waste; including taking measures to manage mercury waste in an environmentally sound manner. The definition of mercury wastes is the substances or objects consisting, containing, or contaminated with mercury or mercury compounds in a quantity above the relevant thresholds that are: (1) disposed of, (2) intended to be disposed of, or (3) required to be disposed of by the provisions of national law or Article 11 (Lennett and Gutierrez 2014).

In Cabo Verde, regulations exist to manage hazardous waste in accordance with the guidelines developed in Basel Convention, but these regulations do not make a specific reference to mercury waste. Guidelines including mercury waste will need to be developed in order to be in compliance with the requirements developed by the COP for the Minamata Convention.

<b>Article 11- Mercury Waste Management</b>		
<b>Principal Uses</b>	<b>Stakeholders (see page 2 for full names)</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
Guidelines required to meet the Convention still need to be reviewed and identified.	Ministry of Agriculture and Environment DNA ANAS DNS INSP Municipalities (Association) DGA Enapor IGAI DGI – General Direction of Industries (UniCV/UniPiaget)	HIGH

## ARTICLE 12: CONTAMINATED SITES

The Article recommends Parties to develop strategies for identifying and assessing sites contaminated by mercury or mercury compounds. The article specifies that the

COP will issue guidance on managing contaminated sites and encourages Parties to cooperate in developing strategies and implementing activities with regards to identifying, managing and remediation of contaminated sites. However, there are no mandatory obligations in cleaning up contaminated sites or for assessing risk to human health.

Cabo Verde has taken measures to develop strategies for identifying and assessing contaminated sites with mercury and mercury compounds. Proper identification of contaminated sites is recommended. The DNA is the institution that has jurisdiction in the coordination of this task according to the MAE by laws.

<b>Article 12 – Contaminated Sites</b>		
<b>Principal Uses</b>	<b>Stakeholders (see page 2 for full names)</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
Contaminated sites in Cabo Verde have not been identified yet.  Efforts required to meet the Convention still need to be reviewed and identified.	Ministry of Agriculture and Environment DNA ANAS DNS INSP Municipalities (Association) DGA Enapor IGAI DGI (UniCV/UniPiaget)	HIGH

### **ARTICLE 13: FINANCIAL RESOURCES**

This Article addresses financial resources available under the Convention financial mechanism and other resources available from multilateral, regional, and bilateral funding sources.

<b>Article 13 - Financial Resources</b>		
<b>Principal Activities</b>	<b>Stakeholders (see page 2 for full names)</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
Cabo Verde will likely require external funding to implement activities on mercury according to the requirements of the	MAE ANAS DNS INSP Municipalities (Association)	HIGH

Minamata Convention and future recommendations by the COP.	DGA	
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### **ARTICLE 16: PUBLIC HEALTH**

These articles addresses promoting the development and implementation of strategies to identify and protect human populations at risk, such as developing fish consumption guidelines, which recognize activities will involve the World Health Organization and public health ministries. Article 16 provides guidance to health ministries, including (1) adopting science-based health guidelines, (2) setting targets for mercury exposure and reduction, and (3) public education (Lennett and Gutierrez 2014). Sensitization sessions and awareness campaigns of communities in terms of prevention, treatment and health care services for the population will be developed.

<b>Article 16 - Public Health</b>		
<b>Principal Activities</b>	<b>Stakeholders (see page 2 for full names)</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
Efforts required to meet the Convention still need to be reviewed and identified.  Sensitization sessions and public awareness about the harmful effects of mercury on human health and the environment need to be developed.	MAE DNA ANAS DNS INSP (UniCV/UniPiaget)	HIGH

### **ARTICLE 18: INFORMATION EXCHANGE AND AWARENESS-RAISING**

The article addresses providing information to the public on mercury and mercury added products with regards to environmental and health impacts. Information to be made available includes: (1) the health and environmental effects of mercury and mercury compounds, (2) alternatives to mercury and mercury compounds, (3)

topics identified in Article 17 (Information Exchange), (4) results of research, development and monitoring activities identified in Article 19, and (5) activities to meet obligations under the Convention (Lennett and Gutierrez 2014).

<b>Article 18 - Information Exchange and Awareness-Raising</b>		
<b>Principal Activities</b>	<b>Stakeholders (see page 2 for full names)</b>	<b>Priority level of this problem associated with mercury based on the Cabo Verde government evaluation:</b>
<p>Cabo Verde is willing to share information on the health and safety of people and the environment, as non-confidential data.</p> <p>Cabo Verde will work to prevent the importation of mercury.</p> <p>Cabo Verde will submit its reports to the COP on the implementation of Convention's obligations progress in accordance with Article 21.</p>	<p>MAE DNA ANAS DNS INSP Municipalities (Association) DGA Enapor IGAI DGI – General Direction of Industries (UniCV/UniPiaget)</p>	<p>HIGH</p>

## **Conclusions**

Cabo Verde will likely ratify the Minamata Convention on Mercury and therefore will be obliged to implement the provisions of the Conventions. Based on this Institutional Gap Analyses, the following is considered:

- Within Cabo Verde, several parts of the Convention are not particularly relevant and therefore may not be part of the country's implementation plan. These are related, but not limited to, in-country chemical manufacturing processes such as production of non-ferrous metals and other processes (Article 5) and ASGM (Article 7);
- In terms of institutional and technical capacity, governmental staff who can oversee effective implementation of mercury assessment may be limited in

the knowledge needed to meet the obligations of the Minamata Convention and therefore may need expert assistance.

- Cabo Verde requires storage facilities for mercury or mercury containing waste products.
- From past exercises, there is generally limited education and awareness among stakeholders and the public on chemical related issues. This is in part related to low awareness by stakeholders. Such limitations reduce the ability of national plans to be effectively executed. Therefore, an education and media plan is a key component of a future information communication.

## **Literature Cited**

Lennett, D. and R. Gutierrez. 2014. Minamata Convention on Mercury: Ratification and Implementation Manuel. Zero Mercury Group.

## **Chapter IV: Identification of Populations at Risks and Gender Dimensions**

## **PRELIMINARY REVIEW OF POTENTIAL POPULATIONS AT RISK AND POTENTIAL HEALTH RISKS**

Environmental factors influence human health, and mercury is a concern for all populations. In Cabo Verde, some populations have a greater risk for mercury exposure due to occupation, social and economic factors, and location. Mercury exposure occurs through ingestion, inhalation, dermal, or transplacental/in utero exposure, and varies in severity based on the extent, duration, frequency, and magnitude of exposure.

As an island nation, Cabo Verde relies heavily on marine resources. The resulting dietary reliance on seafood increases mercury exposure risk, particularly for long-lived predatory species such as tuna. The FAO (2011) reported that the per capita fish consumption for Cabo Verde was estimated at 12.2 kg and the primary catch species were tunas, lobsters, and cephalopods. A large portion of the catch from commercial fisheries is exported, but there is a significant amount catch from small and artisanal scale fishing operations consumed locally. People who are recreational fishers or those that rely heavily on subsistence fishing are of greater risk of mercury exposure.

Information on occupational exposure to mercury is limited for Cabo Verde. Dental amalgam is used throughout the country and therefore presents a mercury risk to those people with the amalgam fillings as well as to dentists and dental hygienists through the processing of the amalgam. Mercury is used in some laboratories in Cabo Verde, but information is lacking so mercury use in these settings was estimated using population size. Laboratory employees may be exposed to mercury through use of the metal, mercury compounds, mercury containing products, and the breaking of devices containing mercury (e.g. thermometers).

The burning of waste at landfills, medical waste incinerators, and informally presents a risk pathway to multiple populations of people. Through the inventory

process it was estimated that each year 39,499 tons (21%) of the collected municipal/general waste totaling 197kg of Hg, is burned in the open (informally or at formally at landfills). An additional 12,623 tons of waste is estimated to be uncollected and assumed to be either informally burned or dumped. Much of the informal burning takes place in urban areas and therefore may impact large numbers of citizens. It was determined that one ton of medical waste is burned each year at medical waste incinerators, however the mercury content of the waste is unknown. The burning of waste represents exposure risk to citizens conducting the burning, landfill and medical incinerator employees, and any residents living downwind of any burning activity.

Assessments of mercury in the environment, occupational settings, and fisheries landings should be paired with public health surveys for Cabo Verde to further identify and understand potential populations at risk of mercury exposure. This effort should be conducted in collaboration with the WHO, local and international researchers and NGOs, and the Ministry of Health and Social Security, and the Ministry of Agriculture and Environment.

### **ASSESSMENT OF POTENTIAL GENDER DIMENSIONS RELATED TO THE MANAGEMENT OF MERCURY.**

Men and women have different exposure risk to harmful chemicals like mercury due to differences in daily life due to occupation, social factors, and family roles.

Potential Occupational Differences contributing to mercury exposure in Cabo Verde:

- Health and hospital care workers
- Industrial workers
- Waste management workers
- Dentists & dental hygienists

Social Factors

- Use of mercury containing cosmetics, soaps, and skin creams

#### Family roles

- Cleaning of broken thermometers, lightbulbs, or other mercury containing products
- Informal burning of waste (household)

Although men and women play traditionally different roles in daily life, following the national policy for gender equity and equality, both genders can be found in all sectors of activities. However, there still are some disparity in terms of numbers and duration of exposure. In this regard, while we may find more women doing tasks such as health and hospital care, or using more cosmetics soaps and skin creams, men can be traditionally found involved in tasks that are more dangerous. For example, more men are found in industrial sectors, or dealing with waste management and harmful products or equipment, such as mercury containing products. On the other hand, women are mostly engaged in performing domestic tasks as in the case of some informal burning in rural settings. In addition, women in general are responsible for the family feeding/cooking and consequently should be informed of the potential risks of high mercury levels in certain fish in order to balance the family diet in a healthier way. Likewise, a diet of fish high in mercury may pose higher risk to a woman and her fetus during pregnancy.

The access to resources, products and services in many cases depends on gender, and many women in Cabo Verde lack control over resources and therefore have limited access to them. The effect of gender stereotypes on the assumptions/expectations made by national policies and programs influence women's participation in all fields of development. Nevertheless, the risk for men are generally greater than for women because men are usually taking the responsibility for more dangerous tasks in society. On the other hand, due to some differences in education, access to resources, and gender bias, women are still

relegated to what is considered less important tasks, which is at the same time less dangerous regarding the exposure to harmful chemicals.

When analyzing the social factor related to the use of mercury containing products such as cosmetics, soaps and skin creams, it is not clear where the risk is greater although it is expected that women are more prone to use these products mostly in urban areas.

## **Chapter V: Awareness/Understanding of Workers and the Public; and Existing Training and Education Opportunities of Target Groups and Professionals**

The exchange of information, training and awareness activities are the basis for the successful implementation of the Minamata Convention. Awareness raising activities have been proposed in the past to promote the implementation of the Basel, Rotterdam and Stockholm Conventions; however these activities were never implemented which could have greatly facilitated the implementation of mercury related activities. These proposed POP activities targeted policy makers, the public, and particularly the technical, scientific, educational and administrative staffs, and industries. The activities included awareness raising, communication of POPs related information, the development and implementation of training and awareness programs, especially for women, children and the less educated, on the harmful effects of POPs as well as their effects on health and the environment, with particular emphasis on alternatives, and finally encouraged industry and professional users to make information available, use the means of dissemination and establish information centers, etc.

Although these activities were proposed and approved among all parties involved, they were not implemented due to financial and technical constraints. The financial constraints are mainly related to the lack of financial resources for the implementation of activities and acquisition of materials and equipment, while technical constraints are reflected by the lack of trained and skilled human resources to perform the tasks as required.

Given the limited awareness raising activities in the past, there is a need to create an awareness raising campaign on the issues surrounding mercury, in particular for risk groups, but also for decision makers. It is important as well to develop mechanisms for the collection and dissemination of information on estimates of its annual quantities of mercury and mercury compounds that are emitted, released or

disposed of through human activities. Given that fish is a common part of the local diet, it would also be advisable to develop a human health advisory about fish consumption in Cabo Verde, focusing healthier versus riskier local fish choices.

## Chapter VI: Implementation Plan & Priorities for Action

The identification of priorities for action is fundamental to the sustainable management of mercury. Until now strategies has been defined only for the management of Persistent Organic Pollutants (POPs), most of it only slightly implemented, it becomes necessary the identification of priorities for action that can contribute to the phase-out of mercury in the country. In this regard, an action plan was developed to identify priorities to meet the commitments of the Convention. The charts below illustrate the priorities set forth for the 2019–2023 timeframe, as well as the estimated costs to perform the activities, the schedule and the institutions in charge of the implementation of each activity.

The Implementation Plan contains the following measures and the action plan:

- Measures to strengthen the national institutional capability and the country’s mercury management legislative framework **(Article 14)**;
- Measures to promote information, awareness and education to the general public **(Articles 17, 18)**;
- Action plan towards the management of mercury-added equipment waste **(Article 4)**;
- Measures to improve the national analytical capability, in addition to the mercury monitoring, research and development **(Articles 14, 19)**; and,
- Action plan towards the progressive reduction of mercury emissions **(Articles 8, 9)**.

The following costs were estimated to implement the measures and actions proposed:

The total estimated amount is USD \$829,000 for a 5-year period.

Priority order	Measures and action plan	Amount (USD)
1	Measures to strengthen the national institutional capability and the country’s mercury management legislative framework <b>(Article 14)</b>	\$58,000
2	Measures to promote information, awareness and education to the general public <b>(Articles 17, 18)</b>	\$163,000

3	Measures to improve the national analytical capability, in addition to the mercury monitoring, research and development <b>(Articles 14, 19)</b>	\$275,000
4	Action plan towards the management of mercury-added equipment waste <b>(Article 4)</b>	\$205,000
6	Action plan towards the progressive reduction of mercury emissions <b>(Articles 8, 9)</b>	\$128,000
<b>Total</b>		<b>\$829,000</b>

<b>Article 14: Building technical assistance capability and technology transfer</b>		Amount USD	Responsible Person	Period
<b>1. Measures to strengthen the national institutional capability and the Country's mercury management legislative framework (Article 14)</b>		<b>\$58,000</b>		
Mercury-added products	Strengthening the National Intersectoral Commission for chemical safety	\$5,000	Environmental Sanitation Department Director/National Director for Environment	2019
	Strengthening the legal realm with competent authorities to update, approve and implement environmental laws in accordance with international standards	\$3,000		2020-2021
	Implementing a law on chemicals, standards, barcode and labeling, as well as tagging to facilitate the environmentally safe handling of chemicals	\$50,000		2020

<b>Article 17: Sharing information Article 18: Information, awareness and training the general public</b>		Amount USD	Responsible Person	Period
<b>2. Measures to promote information, awareness and education to the general public (Articles 17, 18)</b>		<b>\$163,000</b>		
	Preparing informational material in an accessible language, highlighting the risks of mercury to health and the environment	\$10,000		2019-2022

Mercury-added products	Promoting domestic technical reports about mercury	\$5,000	Environmental Sanitation Department Director/National Director for Environment	2019–2022
	Awareness-raising campaigns to recall obsolete mercury-added equipment	\$30,000		2019–2023
	Workshops and awareness-raising actions through the media (TV, radios, newspapers, magazines)	\$50,000		2019–2023
	Nacional Capacity building (trainings) for continuous follow-up of mercury-added products	\$45,000		2019–2023
	Elaborating information brochures on the impact of mercury on health and the environment	\$8,000		2019–2022
	Workshops with NGOs and the civil society	\$15,000		2019–2020

<b>Article 14: Building technical assistance capability and technology transfer</b>		Amount USD	Responsible Person	Period
<b>Article 19: Research, development and surveillance</b>				
<b>3. Measures to improve the national analytical capability, in addition to the mercury monitoring, research and development (Articles 14, 19)</b>		<b>\$275,000</b>		
Mercury-added products	Strengthening existing laboratories and training national technical cadres	\$60,000	Environmental Sanitation Department Director/National Director for Environment/National Director of Health	2019–2021
	Developing nationwide investigations to identify the level of mercury toxicity in the Country	\$40,000		2019–2021
	Establishing sub-regional exchanges for sharing information and experiences related to the ecological and rational management of mercury-added products	\$25,000		2019–2020
	Elaborating mercury-related statistics	\$40,000		2019–2020
	Establishing a multisectoral	\$10,000		2020

	technical team to monitor possible contaminated sites		
	Strengthening existing institutional capabilities	\$20,000	2019-2021
	Strengthening existing laboratories with equipment and consumables to perform chemical, biological and toxicological analyses	\$80,000	2020-2023

<b>Article 4. Mercury-added products</b>		Amount USD	Responsible Person	Period
<b>4. Action plan towards the management of mercury-added equipment waste (Article 4)</b>		<b>\$205,000</b>		
	Creation of center/warehouse for mercury added equipment waste	\$100,000	Environmental Sanitation Department Director/National Director for Environment	2020-2022
	Training for technician from institutions dealing with mercury	\$30,000		2019-2021
	Awareness-raising campaigns to collect obsolete equipment	\$20,000		2019-2021
	Implementing the best techniques and environmental practices available	\$40,000		2019-2021
	Elaborating and publishing procedure guides to identify mercury-added equipment waste	\$15,000		2020-2021

<b>Article 8. Emissions Article 9. Releases</b>		Amount USD	Responsible Person	Period
<b>6. Action plan towards the progressive reduction of mercury emissions (Articles 8, 9)</b>		<b>\$128,000</b>		
	Evaluation, selection and implementation of technology transfer to the main emission sources identified	\$20,000	Environmental Sanitation Department Director/National Director for Environment	2020-2021
	Organization of awareness-raising campaigns in rural communities, schools, etc.	\$8,000		2019-2022
	Preparing a domestic hazardous waste management master plan	\$50,000		2019-2021
	Developing and implementing an ecologically rational policy of hazardous medical waste	\$50,000		2019-2022



## **ANNEX I: Stakeholder Engagement process**

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- MINISTÉRIO DA ECONOMIA E EMPREGO (RESPONSÁVEL PELAS PESCAS);
- MINISTÉRIO DA SAÚDE;
- DIREÇÃO GERAL DA SAÚDE;
- MIOTH (MINISTÉRIO DE INFRAESTRUTURAS E ORDENAMENTO DE TERRITÓRIO E HABITAÇÃO);
- MINISTÉRIO DAS FINANÇAS;
- MINISTÉRIO DA EDUCAÇÃO;
- DIREÇÃO GERAL DAS ALFÂNDEGAS;
- CÂMARA DO COMÉRCIO (BARLAVENTO E SOTAVENTO);
- GRUPO PARLAMENTAR PARA O AMBIENTE;
- IGAE (INSPECÇÃO GERAL DAS ACTIVIDADES ECONÓMICAS);
- INPHARMA;
- INIDA;

- ARFA;
- INDP;
- UNICA;
- UNICV (DEPARTAMENTO DE CIÊNCIAS MARINHAS);
- INSP (INSTITUTO NACIONAL DE SAÚDE PÚBLICA);
- DENTISTAS (ODONTOLOGIA - SECTOR PUBLICO E PRIVADO);
- ICIEG INSTITUTO CABO VERDIANO DA IGUALDADE E EQUIDADE DO GÉNERO;
- AMD ASSOCIAÇÃO DAS MULHERES DEPUTADAS;
- PLATAFORMA DAS ONG;
- INSTITUTO DE QUALIDADE;
- ELECTRA;
- ANAS;
- ENAPOR;
- POLÍCIA NACIONAL (MARÍTIMA, E DE FRONTEIRAS);
- SNPC (SERVIÇO NACIONAL DE PROTECÇÃO CIVIL);

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- MINISTÉRIO DA SAÚDE;
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convenção de Roterdão ponto focal para pesticidas

**ANNEX II: UNEP TOOLKIT Calculation Spreadsheet**

(Attached separately)