



Montenegro
Ministry of Ecology, Spatial Planning and Urbanism

National Implementation Plan of the Minamata Convention on Mercury with the Action Plan for the period 2022-2023 and the Minamata Initial Assessment Report

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Introduction

Mercury (Hg) is a naturally-occurring element, a shiny metal that is liquid at room temperature. Pure mercury is rarely found in nature, and is obtained mostly from cinnabar ore. Mercury and most of its compounds are very toxic to humans and the environment, and even relatively small doses / concentrations can have serious adverse effects on neurological development. Mercury is persistent and bioaccumulative.

Elemental mercury that is released into the atmosphere is eventually deposited in the aquatic environment where it can be converted with the help of bacteria into methylmercury, its most toxic form.

- *Compliance with international strategic documents*

The final intergovernmental negotiating session on the Minamata Convention on Mercury was held in Geneva in January 2013, where a final agreement was reached on the text of the new treaty. The treaty was adopted in October 2013 at a diplomatic conference in Japan, and it seeks to reduce the supply and trade of mercury, and phase out or phase down certain products and processes where mercury is used, as well as control mercury emissions and discharges.

In October 2020, the European Commission adopted the EU Chemicals Strategy for Sustainability. The strategy is the first step towards meeting the ambition of zero environmental pollution with toxic products announced in the European Green Deal. The strategy will increase innovation for the safe and sustainable use of chemicals and increase the protection of human health and the environment from hazardous chemicals. This includes banning the use of most harmful chemicals in consumer products such as toys, childcare items, cosmetics, detergents, food contact materials and textiles, unless proven to be necessary for society.

The EU already has one of the most comprehensive and protective regulatory frameworks for chemicals, supported by the most advanced knowledge base globally. This regulatory framework is increasingly becoming a model of safety standards around the world¹. The EU is undoubtedly successful in creating an efficient internal market for chemicals, reducing risks to humans and the environment posed by certain hazardous chemicals, such as carcinogens and heavy metals², and providing a predictable legislative framework for companies.

The 2010 EU Mercury Strategy aims to reduce and, where feasible, completely eliminate global anthropogenic discharges of mercury into the air, water and land. In the last 10 years since the adoption of the Strategy and a set of measures concerning emissions, supply, demand and use of mercury, as well as the management of surplus and mercury stocks, significant progress has been made in the EU in the field of mercury management. The strategy recommended that the conclusion of an international legally binding instrument on mercury should be a priority, as EU action alone cannot guarantee effective protection of citizens from the harmful effects of mercury on health.

Montenegro is proclaimed by the Constitution as an ecological state and prescribes the protection of natural heritage. Since 2006, Montenegro has acceded to major international environment forums, established environmental institutions and adopted modern legal norms in this area. Montenegro has also acceded to a large number of multilateral agreements (conventions) on environmental protection, by adopting instruments of succession or the process of accession or ratification.³

¹ A. Bradford, The Brussels effect, 2020

² Mercury, cadmium and arsenic, SWD(2019)199

³ Montenegro is a signatory to: the Basel Convention, the Rotterdam Convention, the Stockholm Convention, the UN Convention on Biodiversity, the Kyoto Protocol, the Carthage Protocol, the Nagoya

Montenegro has been a signatory to the Minamata Convention since September 2014, and ratified it in March 2019. By ratifying the Minamata Convention, Montenegro has committed to promote the development and implementation of strategies and programs to identify and protect the population, especially vulnerable groups from exposure to mercury and mercury compounds. The National Plan for the Implementation of the Minamata Convention will contribute to meeting of all obligations arising from the Minamata Convention.

- Methodology and content of the National Plan

In order to implement the requirements of the Minamata Convention, in the period 2016-2017 Montenegro prepared the Minamata Initial Assessment (MIA), through a GEF-funded project, in order to provide facts on the situation in Montenegro in this area and to support the decision-making process, both in terms of ratification and the necessary steps to be taken in the future implementation of the Convention. As part of the development of the MIA, the Mercury Inventory for 2015 has been prepared, which is an integral part of this document, and includes a cross-section of all categories that are considered to be sources of mercury emissions into the environment, in accordance with the official Toolkit for Identification and Quantification of Mercury Releases, developed by the Chemicals Branch of the United Nations Environment Program (UNEP).

The categories covered by the Inventory were energy consumption and energy production, domestic production of metals and raw materials, domestic production and processing using mercury, waste and wastewater management system, general consumption of mercury in products and other sources of mercury release.

The National Implementation Plan of the Minamata Convention on Mercury, with the Action Plan for the period 2022-2023 should, based on the analysis and assessment of the situation in Montenegro, determine main strategic directions and measures for the development of the mercury management system in Montenegro, which will be fully harmonized with EU legislation and practice and ensure equal protection of human health and the environment from the harmful effects of mercury through interdepartmental cooperation.

The National Implementation Plan of the Minamata Convention on Mercury, with the Action Plan for the period 2022-2023, determines appropriate activities that can be implemented in this period, taking into account the identified strengths, weaknesses and shortcomings, existing legislative and institutional framework, administrative and technical capacities, and priority needs. In addition, the situation analysis within the plan provides a broader picture that contains information on all relevant issues important for chemicals management in the long term period so that this strategic document can serve as evidence of a clear vision for safe chemicals management policy in Montenegro, which is a precondition for raising funds necessary for the implementation of planned activities, both from external sources and from the budget.

- Compliance with the existing strategic framework

Protocol, the London Convention, the UN Convention to Combat Desertification (UNCCD), the UN Framework Convention on Climate Change (UNFCCC), the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), the Berne Convention, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Ramsar Convention, the Montreal Protocol, the International Convention for the Prevention of Pollution from Ships (MARPOL Convention), the International Plant Protection Convention (IPPC), the Espoo Convention, the Protocol on Strategic Environmental Assessment, the Aarhus Convention, the Convention on Long-range Transboundary Air Pollution (CLRTAP) and the EMEP Protocol to the Convention and the Barcelona Convention.

The National Implementation Plan of the Minamata Convention on Mercury, with the Action Plan for the period 2022-2023, has been drafted taking into account the strategic directions of Montenegro defined in the following umbrella strategic documents:

- **Montenegro's Program of Accession to the European Union**, which in terms of chemicals management contains the dynamics of further harmonization of national regulations with relevant EU regulations;
- **Montenegro Development Directions**, which in terms of chemicals management emphasizes the need to establish the National Help Desk, the National Center for Poison Control and the Register of Chemicals in the appropriate form;
- **National Strategy for Sustainable Development**, which determines the principles, strategic goals and guidelines for achieving long-term sustainable development of the society by 2030, taking into account international commitments in line with the UN Sustainable Development Goals and EU accession commitments. Among other things, certain measures related to Objective 12. *Ensure sustainable consumption and production patterns*, including improvements in the field of chemicals management.

The objectives set out in this National Plan are in line with the recommendations of other sectoral strategic documents and plans that are important for mercury management and related to the meeting of international commitments, namely:

- **National Chemicals Management Strategy 2019-2022, with the Action Plan for the period 2019-2022** was adopted in March 2019 on the basis of a comprehensive analysis and assessment of the state of chemical safety in Montenegro, with the aim of determining the main strategic directions and measures for the development of the chemical management system in Montenegro. The general strategic goal defined by the Strategy is to build a chemical management system that provides a high level of human health and environmental protection, as well as improving free trade with EU and other countries while encouraging competitiveness of the Montenegrin economy through the introduction of safer chemicals and technological processes. The stated strategic goal will be achieved through the achievement of 7 operational goals, which partly include mercury management.
- **Montenegro Waste Management Strategy until 2030** contains a wide range of objectives related to the creation of conditions that will contribute to improving the quality of life of the population, relying on the National Strategy for Sustainable Development of Montenegro until 2030. The Strategy sets goals in accordance with the need to ensure synergies between state development and environmental protection in terms of the impact of waste on the quality of its basic parameters. The overall goal to be achieved in the field of waste management is to establish a sustainable waste management system and its continuous improvement.

Chapter II: Situation analysis

2.1. Review of the legislative framework

The existing legislative framework in the field of environment and climate change is based on the following strategic documents: Action Plan for the implementation of the Air Quality Management Strategy 2017-2020, National Climate Change Strategy until 2030, National Strategy for Sustainable Development until 2030, National Waste Management Strategy until 2030, National Chemicals Management Strategy 2019-2022, the National Implementation Plan for the Stockholm Convention 2019-2023, National Action Plan to Combat Desertification and more.

The Minamata Convention has been ratified through the **Law on Ratification of the Minamata Convention on Mercury** (“**Official Gazette of Montenegro-International Agreements**”,

No. 3/19). Taking the preservation of the health of its citizens very seriously, Montenegro is participating in international efforts to limit air emissions and discharges of mercury into water and land. Measures are being taken at national level to reduce emissions and use of mercury, but in order to fully protect its citizens it is necessary to act globally, as mercury exposure is largely caused by emissions from other parts of the world.

On July 28, 2016, the Parliament of Montenegro adopted the **Law on the Environment** (“Official Gazette of Montenegro”, No. 52/16), which is the *lex generalis* for the environment and provides a basis for the adoption of other legal acts on the environment. The basic provisions of the law define the principles of sustainable development and environmental management, entities, instruments and measures in the field of environmental protection, access to information, public participation, judicial protection, finance and all other issues relevant to this area. The law regulates special measures, which should be implemented in order to prevent, reduce or mitigate the negative impacts of mercury in the environment.

Furthermore, the Law on the Environment prescribes restrictions on the export of metallic mercury, cinnabarite, mercury chloride, mercury oxide and metallic mixtures of mercury with other substances, including mercury alloys, with a mercury concentration of at least 95% by weight. This prohibition does not apply to the export of mercury products used for scientific research, as well as for medical and analytical purposes. In addition, the mixing of metallic mercury with other substances for the purpose of exporting metallic mercury is prohibited. Waste generated from metallic mercury and a safe way of its disposal is also arranged.

The Law on Chemicals (“Official Gazette of Montenegro”, No. 51/17), as well as a set of secondary legislation that achieved the transposition of the EU acquis in the field of chemicals management, regulate the management of chemicals and are a key instrument for harmonization with the EU acquis. The law regulates the procedure for classification, labeling and packaging of chemical products, based on the assessment of their physical and chemical properties, characteristics that affect human life and health, as well as features that affect the environment, and it establishes criteria for classification into special hazard groups.

Pursuant to the Law on Chemicals, **the Rulebook on detailed contents of prior notification for export of chemicals** (“Official Gazette of Montenegro”, No. 116/20) was adopted. The Rulebook transposed the PIC regulations and listed mercury compounds, including inorganic mercury compounds, alkyl mercury compounds, alkyloxyalkyl and aryl mercury compounds, which are on the List of Banned or Restricted Chemicals in the Rotterdam Convention. In addition, the **Rulebook on the list of hazardous chemicals and products whose export is prohibited** (“Official Gazette of Montenegro”, No. 68/20) states in Part II of Annex I that mercury is a chemical substance whose export is prohibited.

The Regulation on Prohibited or Permitted Uses, Production and Placing on the Market of Chemicals That Represent an Unacceptable Risk to Human Health and the Environment (“Official Gazette of Montenegro”, No. 71/18) prohibits placing on the market and use of substances or mixtures containing mercury compounds, if these substances or mixtures are intended for the following uses:

- prevention of the development and settlement of microorganisms, plants or animals: on the hull of vessels; on cages, nets, floating objects and means or equipment used for fish or shellfish farming; on completely or partially submerged equipment and accessories;
- wood protection;
- impregnation of high-strength industrial textiles and yarns for their production;
- for the treatment of industrial waters.

The Regulation prohibits the import, export and production of products containing mercury, such as thermometers and other measuring devices intended for free sale (manometers, sphygmomanometers, pressure gauges, barometers, thermometers, etc.).

Furthermore, measuring devices containing mercury intended for industrial and professional purposes may not be placed on the market: barometers, hygrometers, manometers, sphygmomanometers, tightening indicators used with plethysmographs, strain gauges, thermometers and other non-electric thermometers.

The import, export and production of biocides, pesticides and topical antiseptics to which mercury has been added and cosmetic products to which mercury has been added are prohibited.

The import, export and production of switches and relays are prohibited, except very high accuracy capacitance and loss measuring bridges and high-frequency PF switches and relays in monitoring and control instruments, whose maximum mercury content is 20 mg per bridge, switch or relay.

As explained in the previous part, the mercury issue is multisectoral and when defining the national approach and action plan, several aspects of regulating this matter need to be considered, taking into account parallel processes of harmonization with sectoral requirements (water management, waste management, control of industrial pollution, etc.).

An overview of the most important aspects to be taken into consideration is given below.

Mercury is classified as acutely toxic, corrosive to skin, mutagenic category 2, STOT RE 1, aquatic acute and aquatic chronic, reproductively toxic. Taking into account the above, mercury is covered by Directive 2012/18 / EU on the control of major-accident hazards involving hazardous substances (SEVESO III Directive) and may belong to more than one Seveso category. The Law on the Environment provided the legal basis for the transposition of the SEVESO III Directive. Further harmonization with the SEVESO III Directive has been carried out with adoption of the Rulebook on the quantities of hazardous substances by categories that determine the degree of risk of Seveso plant ("Official Gazette of Montenegro", No. 63/16) and the Rulebook on the detailed content of the prevention plan and accident protection plan ("Official Gazette of Montenegro", No. 67/16).

The issues of **mercury-containing products**, i.e., mercury content, placing on the market and import into the EU of a wide range of mercury-containing products (e.g. batteries, electrical and electronic equipment, thermometers), are regulated by the Battery Directive, the RoHS Directive (lamps, relays), as well as the REACH Regulation and the Cosmetics Regulation.

Law on Waste Management ("Official Gazette of Montenegro", No. 64/11, 39/16) and Regulation on the manner and procedure for the establishment of the system of taking, collecting and treatment of waste deriving from batteries and accumulators and on the system functions ("Official Gazette of Montenegro", No. 39/12) have partially transposed the Directive 2006/66 / EC on batteries and accumulators and waste batteries and accumulators. Montenegro has asked the EU to allow a transitional period for the full implementation of Directive 2006/66 / EC on batteries and accumulators and waste batteries and accumulators.

Directive 2011/65 / EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (ROHS Directive) was transposed through the Rulebook on threshold values for the presence of hazardous substances in electrical and electronic products ("Official Gazette of Montenegro", No. 067/18).

Mercury in terms of waste, as well as mercury-containing or contaminated waste, qualifies, in most cases, as hazardous waste in accordance with the Waste Framework Directive. The Landfill Directive further establishes specific requirements for the storage of mercury-containing waste for more than one year, in order to ensure the safe management of this waste.

The Law on Cosmetic Products (“Official Gazette of Montenegro”, No. 24/19) transposed Regulation (EC) No. 1223/2009 of the European Parliament and of the Council of 30 November 2009 on cosmetic products. Supervision over the implementation of this law and regulations adopted on the basis of this law is performed by the Ministry of Health, while the inspection is performed by the Directorate for Inspection Affairs (DIA), through the sanitary inspection.

The Law on Industrial Emissions (“Official Gazette of Montenegro”, No. 17/19) prohibits the use of mercury, mercury compounds and mercury mixtures in plants or appropriate production processes. The use of mercury, mercury compounds and mercury mixtures in production processes is allowed in the production of: sodium or potassium methylate and ethylate, in compliance with the prescribed conditions. The application of production processes using mercury or mercury compounds is prohibited, if these processes were not applied before January 1, 2018, as well as the production and placing on the market of new products containing mercury.

Mercury emissions from large industrial plants are regulated by the Industrial Emissions Directive (IED), which requires all installations to perform activities based on the conditions contained in the integrated permit and apply best available techniques (BAT).

The segment concerning **emissions to air, water and land** is regulated, inter alia, by the **Law on Air Protection** (“Official Gazette of Montenegro”, No. 25/10, 43/15) which regulates the method of air quality monitoring, protection measures, assessment and improvement of air quality, as well as air quality planning and management and by the **Law on Waters** (“Official Gazette of the Republic of Montenegro”, No. 27/07, “Official Gazette of Montenegro” 73/10, 32/11, 47/11, 48/15, 52/16 and 84/18) which regulates the legal status and manner of integrated management of waters, water and coastal land and water facilities, conditions and manner of performing water activities, etc.

The Regulation on quality and sanitary-technical conditions for wastewater discharge, manner and procedure of testing wastewater quality and content of the report on the determined wastewater quality (“Official Gazette of Montenegro”, No. 56/19) prescribes the quality and sanitary-technical conditions for discharge of wastewater into the recipient and public sewerage, including requirements depending on the industry that discharges wastewater, manner and procedure of testing the quality of wastewater, the minimum number of tests and the content of the report on the determined quality of wastewater.

Pursuant to Article 67 of the **Law on Agricultural Land** (“Official Gazette of the Republic of Montenegro”, No. 15/92), the Ministry of Agriculture, Forestry and Water Management adopted the Rulebook on Permitted Quantities of Hazardous and Harmful Substances in Soil and Methods of Their Testing (“Official Gazette of the Republic of Montenegro” No. 18/97). This Rulebook prescribes the maximum permitted quantities of hazardous and harmful substances in the soil, which can lead to its pollution, and which are caused by improper use of mineral fertilizers and plant protection products by legal entities and natural persons, as well as discharge of waste materials from various sources. The maximum allowable concentrations (MAC) of mercury are: 1.5 mg / kg of soil.

Annex 1 provides an overview of every article of the Minamata Convention and a list of national policies and / or regulatory measures addressing the topic of the given article of the Convention, with proposals for compliance with the article of the Convention.

2.2 Institutional framework

The review of the institutional framework aims to present the complexity of the existing national system and the division of competences over environmental policies and over the implementation of the Minamata Convention in Montenegro. The holders of the processes related to the activities within the Minamata Convention, the key factors, their specific competences and a description of each of them are presented.

Ministry of Ecology, Spatial Planning and Urbanism (MESPU)

Ministry of Ecology, Spatial Planning and Urbanism is a key institution for meeting the obligations arising from most international agreements in the field of environment, transposition of European regulations in the field of horizontal legislation, air quality, waste management, nature protection, industrial pollution control, chemicals management, climate change, noise protection and the creation of environmental systems and policies in accordance with the obligations arising from the process of harmonization in the field of environment.

Within the Ministry, the Department for Ecology and the Department for Waste Management and Utility Services are important for the area of mercury management.

The Department for Industrial Pollution Control and Chemicals Management is responsible for drafting the national legal and strategic framework for the field of chemicals management. The Department also carries out tasks related to the harmonization of national legislation with the EU acquis in the field of industrial pollution, as well as participation in the work of international conventions and bodies relevant to the field.

The Department for Waste Management and Utility Services is responsible for creating the national legal and public policy framework in the field of waste management, including the transposition of regulations in this area.

Environmental Protection Agency (EPA)

There are 4 sectors within the Agency, 3 of which are for the implementation of regulations governing mercury management.

The Sector for the Issuance of Permits and Consents performs activities related to: issuing integrated permits, implementing European directives related to industrial pollution (IED, IPPC and LCP), and controlling the risk of major accidents involving hazardous substances (SEVESO III); conducting the procedure of determining liability for damage or imminent danger of damage to the environment; issuing waste management permits; issuing permits for management of biocidal products and chemicals.

The Sector for Environmental Monitoring performs activities related to: preparation of proposal for environmental monitoring program which contains monitoring programs for individual segments of the environment and the area, adopted on the basis of special regulations; development and maintenance of environmental databases; keeping an inventory of emissions and other.

The Sector for Project Management and Information Support for International and National Environmental Reporting in the field of environmental protection performs activities related to: establishing an environmental protection information system for the purpose of efficient identification, classification, processing, monitoring and record keeping of natural resources and environmental management, as well as keeping an integrated cadaster of pollutants.

Directorate for Inspection Affairs (DIA) - Sector for Environmental Protection, Safety and Human Health, Social and Child Protection performs supervision over the implementation of laws, other regulations and general acts related to environmental protection (Department of Environmental Inspection), and over the implementation of laws related to water management (Department of Water Inspection). When it comes to chemicals, the sanitary and environmental inspection are responsible for inspection supervision over the application of regulations in this area, while the supervision of cosmetic products is the responsibility of the sanitary inspection.

Ministry of Health (MoH)

The Ministry of Health is responsible for monitoring environmental protection measures that affect the health of citizens. MoH performs safety and conformity assessment of a cosmetic product before placing it on the market, for the safety and protection of human life and health.

The Institute for Medicines and Medical Devices was established by the Government of Montenegro, by the Decision on the Establishment of the Agency for Medicines and Medical Devices of October 2, 2008 ("Official Gazette of Montenegro", No. 62/08). The establishment of the Agency is envisaged by the Law on Medicines and the Law on Medical Devices, which are the basis of national legislation in the field of medicines and medical devices, which has been harmonized with the requirements and standards of the EU acquis in these areas since 2004.

Ministry of Agriculture, Forestry and Water Management (MAFWM)

The Ministry of Agriculture, Forestry and Water Management (MAFWM) within the Directorate for Water Management performs activities related to: development policy in water management; system solutions for the provision and use of water, water land and water sources for water supply, protection of water from pollution, regulation of water and watercourses and protection against the harmful effects of water, normative activity governing water and water land management; proposal of professional bases when drafting laws and other regulations governing these areas; works on harmonization of national legislation with EU legislation in the field of water; proposal of the adoption of laws and other strategic documents; proposal of plans and programs in the field of water; monitoring of the situation in the field of water, proposing and adopting the necessary measures; cooperating with the European Union and other international institutions in the field of water.

Water Administration

The Water Administration performs activities related to providing and implementing measures and works on protection of waters from pollution, issuing water acts, establishing and maintaining water information system, water cadasters, register of waters of importance for Montenegro, monitoring of natural and other phenomena, competence in law enforcement, preparation of professional bases for regulations, plans and programs adopted by the Government and the Ministry in charge of water affairs.

Revenue and Customs Administration

The Ministry of Finance and Social Welfare, through the Revenue and Customs Administration, performs activities related to, inter alia: the application of regulations relating to goods brought into the customs territory until the customs-approved treatment or use of goods is determined (customs supervision, declaration of goods, submission goods, accommodation of goods); approval of customs-approved treatment or use of goods (placing of goods under a customs procedure, entry of goods into a free zone or free warehouse, re-exportation of goods from the customs territory, destruction of goods, abandonment of goods to the state); performing customs control; determining the origin of goods; conducting measures of customs investigation and intelligence work in order to prevent and detect customs offenses and criminal offenses committed in violation of customs regulations, as well as submitting a report to the competent prosecutor's office; control of import, export and transit of goods for which special measures are prescribed.

Institute of Public Health

The Institute of Public Health is a highly specialized health care institution, whose activities are aimed at preserving and improving the health of all citizens. In performing its activities, the Institute contributes to the management of chemicals by performing the following tasks:

- It proposes and implements measures regarding the control of the health safety of foodstuffs and objects of general use, the hygienic safety of drinking water, surface and waste water;
- It monitors, analyzes and assesses the impact of environmental quality (air, land and noise) on the health of the population;
- It supervises and controls harmful biological agents (through disinfection, disinsection and deratization) and chemical agents;
- It collects and processes the prescribed health statistics and prepares and publishes the "Statistical Yearbook", bulletins and other publications related to the activities of the Institute;

Institute of Hydrometeorology and Seismology (IHS)

The Institute of Hydrometeorology and Seismology performs water monitoring, as well as EMEP monitoring of the transmission of pollution, including mercury through the air.

Center for Ecotoxicological Research of Montenegro (CETI)

The Center for Ecotoxicological Research of Montenegro was established by the Decision of the Government in 1996 in order to control the quality of all segments of the environment in Montenegro, including ecotoxicological monitoring of all segments of the environment (air, surface water and groundwater and sea, wastewater, drinking water, land), as well as testing of ionizing radiation, testing of noise and vibration in the environment and working environment, measuring emissions from sources, analysis in case of accidents, waste categorization and storage management of low-radioactive and medium-radioactive waste.

Environmental information - Aarhus Centers

The establishment of the Aarhus Centers is one of the preconditions for the legal and institutional implementation of the Aarhus Convention, i.e., capacity building at the administrative and institutional level. It also represents the construction of a system that is available to citizens, the NGO sector, businesses and all other stakeholders.

Three Aarhus Centers have been opened in Montenegro: Podgorica (organizational unit of the Environmental Protection Agency), Nikšić (part of the "Ozone" NGO) and Berane (organizational unit of the Environmental Protection Agency). In May 2014, the "Breznica" ecological association opened the regional Aarhus Center in Pljevlja, which is used by the citizens of Pljevlja, Mojkovac, Bijelo Polje, Prijepolje, Priboj, Čajniče and Goražde. The goal of establishing the Aarhus Centers in Montenegro is to provide interested citizens with information in the field of environmental protection, raise public awareness on this issue and encourage public participation in decision-making and contribute to cooperation with local self-governments in the field of environment.

CHAPTER III: INITIAL ASSESSMENT REPORT - Mercury inventory and emission and resource identification

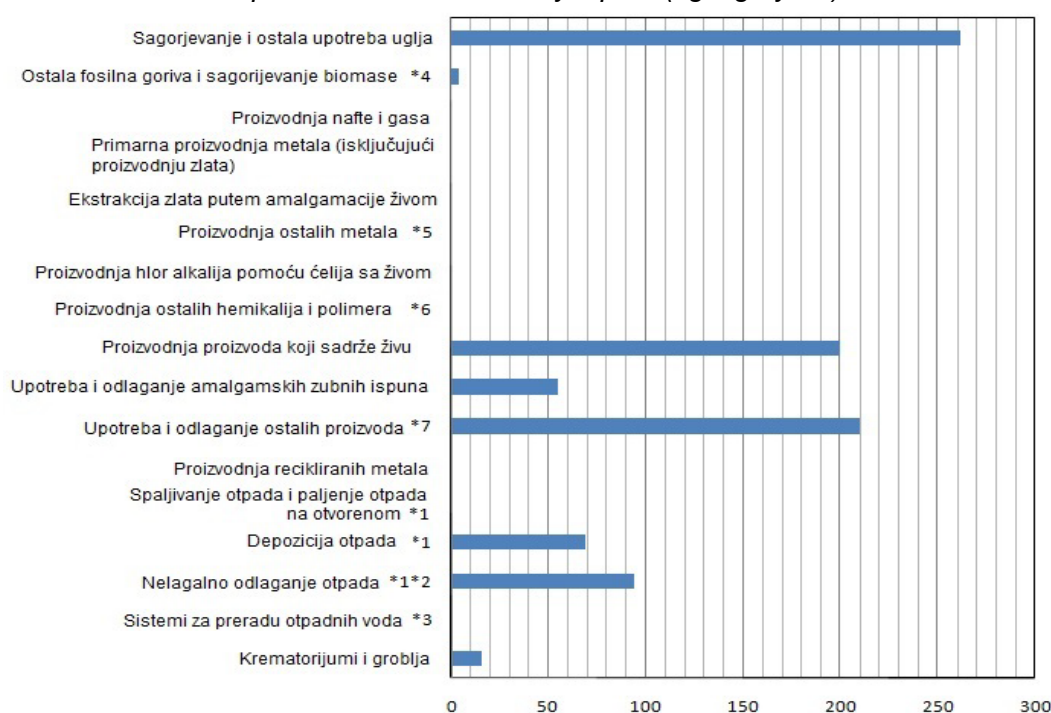
Mercury inventory results

The National Inventory of Mercury Emissions from different sectors was prepared by the Center for Ecotoxicological Research, Podgorica (CETI). Data from 2015 were used for the

inventory, where available. This inventory has been updated based on level 1 of the mercury release calculation tool. Level 1 of the inventory is based on predetermined factors used to calculate the discharge of mercury into the environment and its release, i.e., on standard input factors and standard distribution of output factors. Level 1 of the Toolkit is based on the analysis of documentation, where the values of emissions and discharges are estimated based on pre-established assumptions.

The graph below shows the main sources of mercury emissions, such as **coal combustion and other coal uses**, with an estimated 262 kg of mercury per year, **use and disposal of other products** with 210 kg of mercury per year, followed by **illegal disposal of municipal waste** (94 kg of mercury per year) and **waste disposal** (692 kg of mercury per year). Other important sources with significantly lower emissions are: wastewater treatment systems (71 kg), application, use and disposal of dental amalgam fillings (55 kg), combustion of other fossil fuels / biomass (21 kg) and cemeteries (16 kg).

Graph 1: Estimated mercury inputs (kg Hg / year) 4



Combustion in large power plants (220.3 kg Hg / year); improper disposal of municipal waste (94 kg Hg / year); energy and heat production from biomass combustion (16.6 kg Hg / year); other uses of coal (11.9 kg Hg / year); mercury-containing electrical switches and relays (26.6 kg Hg / year) are subcategories of sources that have the largest share in release of mercury into the air.

Improper disposal of municipal waste (94 kg Hg / year); wastewater treatment systems (63.6 kg Hg / year); dental amalgam fillings (24.2 kg Hg / year); thermometers (12 kg Hg / year); and

⁴ Notes to the table: * 1: In order to avoid double counting of mercury in domestically produced products sold on the domestic market (including oil and gas), only part of the mercury input released from production is included in the TOTAL input. * 2: In order to avoid double counting of mercury input from waste and products in the TOTAL value of inputs, this total input value includes only 10% of inputs from waste incineration, waste disposal and illegal disposal. This 10% represents approximately the share of mercury in waste from materials that were not individually measured at level 1 of the Toolkit inventory. * 3: Estimated quantities include mercury in products which is also included in every product category. To avoid double counting, discharges into the land from illegal disposal of general waste are automatically deducted from the TOTAL amounts. * 4: Estimated input and discharge into the water include quantities of mercury that are also included in every source category. To avoid double counting, input and discharge into the water from the wastewater treatment system is automatically deducted from the TOTAL amounts. * 5: Total input values do not necessarily reflect total output values due to adjustments in double counting (see notes * 1– * 3) and because mercury accompanies products / metallic mercury that are not sold in the same country or in the same year.

laboratory chemicals (2.1 kg Hg / year) are the subcategories that have the largest share in the release of mercury into water.

Illegal disposal of municipal waste (752.0 kg Hg / year); cemeteries (15.8 kg Hg / year); electrical switches and relays containing mercury (35.4 kg Hg / year); dental amalgam fillings (“silver” fillings) (4.4 kg Hg / year) are the categories that have the largest share in the release of mercury into the land.

Basic priorities for further assessments, determined during the inventory drafting:

1. Estimated values for the use and disposal of other mercury-containing products are a significant category contributing to mercury releases in Montenegro (mercury-containing thermometers and sphygmomanometers, mercury-containing batteries and mercury-containing light sources). Import data for some mercury-containing products (e.g. sphygmomanometers) are often unclear, as well as for product groups and items listed under HS headings. For example, HS tariff codes do not make difference between compact fluorescent lamps (CFLs) and fluorescent tubes (which have different mercury contents). In addition, the mercury content in energy-efficient lamps often varies depending on the brand. Therefore, import data should be compared and cross-checked against information and data obtained from other sources (e.g. from importers / distributors; conducting assessments / surveys of users, etc.) in order to get a clear and precise picture of the current situation.
2. Mercury content in energy source for energy production, i.e., the origin and content of mercury in coal and heavy oil used in Montenegro (domestic or imported).
3. Other areas of further analysis include electrical switches, information on this area (actual figures versus estimates) could be obtained from the industrial sector, mechanics or auto electricians.
4. Public dental institutions still use dental (mercury) amalgam. Special practices for managing mercury-containing waste have not yet been promoted and established. It is necessary to determine the amount of dental amalgam that is imported annually in order to get an idea of the extent to which alternative fillings are used in relation to amalgam fillings. In addition, it is necessary to promote early action in order to phase out dental amalgams, and improve the practices of management of amalgam containing waste in order to minimize releases to the environment.

3.1 Review of mercury emissions, stocks, supplies and trade

3.1.1 Types of present sources from which mercury is released

Table 1 shows the sources of mercury emissions identified in Montenegro as present or absent. Only those types of sources that have been identified as present are included in the quantitative assessment.

Table 1: Identification of mercury emission sources in Montenegro: present sources (Y), absent sources (N)

| Source category | Present sources (Y/N)? |
|--------------------|------------------------|
| Energy consumption | |

| | |
|--|---|
| Coal combustion in large power plants | Y |
| Other uses of coal | Y |
| Combustion / use of petroleum coke and heavy oil | Y |
| Combustion / use of diesel, gas coal, petroleum, kerosene, LPG and other light to medium distillates | Y |
| Use of raw or previously purified natural gas | N |
| Use of gas from the gas pipeline (quality for consumers) | N |
| Energy and heat production from biomass combustion | Y |
| Combustion of wood charcoal | Y |
| Fuel production | |
| Oil extraction | N |
| Oil processing | N |
| Extraction and processing of natural gas | N |
| Primary metal production | |
| (Primary) extraction of mercury and initial processing | N |
| Zinc production from concentrates | N |
| Copper production from concentrates | N |
| Lead production from concentrate | N |
| Extraction of gold by methods that do not include amalgamation with mercury | N |
| Alumina production from bauxite (aluminum production) | N |
| Primary production of ferrous metals (production of pig iron) | N |
| Extraction of gold by amalgamation with mercury - without the use of retort | N |
| Extraction of gold by amalgamation with mercury - with the use of retort | N |
| Production of other materials | |
| Cement production | N |
| Pulp and paper production | N |
| Production of chemicals | |
| Production of mercury cells chlor-alkali | N |
| Production of vinyl chloride monomer with mercury catalyst | N |
| Production of mercury catalyst acetaldehyde | N |
| Production of mercury-containing products | |
| Mercury thermometers (medical, air, laboratory, industrial, etc.) | N |
| Electrical switches and relays with mercury | N |
| Mercury light sources (fluorescent, compact, other: see Guidelines) | N |

| | |
|---|---|
| Mercury batteries | N |
| Mercury manometers and mercury measuring instruments | N |
| Mercury biocides and mercury pesticides | N |
| Paints with mercury | N |
| Skin lightening creams and soaps with mercury-containing chemicals | N |
| Use and disposal of mercury-containing products | |
| Dental amalgam fillings (silver fillings) | Y |
| Thermometers | Y |
| Electrical switches and relays with mercury | Y |
| Mercury light sources | Y |
| Mercury batteries | Y |
| Polyurethane (PU, PUR) produced with a mercury catalyst | N |
| Paints with mercury based preservatives | N |
| Skin lightening creams and soaps with mercury-containing chemicals | N |
| Medical instruments for measuring blood pressure (sphygmomanometers with mercury) | Y |
| Other manometers and measuring instruments with mercury | Y |
| Laboratory chemicals | Y |
| Other laboratory and medical equipment with mercury | N |
| Production of recycled metals | |
| Recycled mercury production (secondary production) | N |
| Production of recycled ferrous metals (iron and steel) | Y |
| Waste incineration | |
| Incineration of municipal / general waste | N |
| Incineration of hazardous waste | N |
| Incineration and open incineration of medical waste | N |
| Sewage sludge incineration | N |
| Incineration of waste in the open (on landfills and illegal landfills) | Y |
| Waste disposal / landfill disposal and wastewater treatment | |
| Controlled landfills | Y |
| Illegal disposal of municipal waste ^{*1} | Y |
| Wastewater treatment system | Y |
| Crematoria and cemeteries | |
| Crematoria | N |
| Cemeteries | Y |

However, it should be noted that the sources of mercury emissions which are presumed to be smaller and which are listed in Table 2, are not included in the detailed source identification and measurement for inventory level 1.

Table 2: Mercury sources not included in the quantitative inventory; with a preliminary indication of a possible presence in the country

| Source category | Present sources (Y/N)? |
|---|------------------------|
| Combustion of oil shale | N |
| Combustion of peat | N |
| Geothermal energy production | N |
| Production of other recycled materials | N |
| Lime production | N |
| Production of lightweight aggregates (baked clay balls for construction purposes) | N |
| Production of other chemicals (besides chlorine and sodium hydroxide) in mercury cell chlor alkali plants | N |
| Production of polyurethane with mercury catalysts | N |
| Seed protection with mercury-containing materials | N |
| Semiconductor UV-radiation detectors | N |
| Catheters and intestinal probes (medicine) | N |
| Educational purposes | Y |
| Mercury gyroscopes | N |
| Vacuum pumps with mercury | N |
| Mercury used in religious ceremonies (amulets and other uses) | N |
| Mercury used in traditional medicine (Ayurvedic and others) and homeopathic medicine | N |
| Use of mercury as a refrigerant in certain cooling systems | N |
| Lights (light leveling bearings for maritime navigation) | N |
| Mercury in large bearings of rotating mechanical parts in, for example, older wastewater treatment plants | N |
| Tanning | N |
| Pigments | N |
| Steel browning and marking products | N |
| Certain types of paper for color photographs | N |
| Recoil reducer for firearm | N |
| Explosives (mercury-fulminate) | N |
| Firework | N |
| Toys | Y |

3.1.2. Mercury releases into the environment

The release of mercury into the environment means the amount of mercury that could be released during economic activities in the country, i.e., it refers to mercury used in products such as thermometers, blood pressure measuring instruments, fluorescent lamps, etc. It also includes mercury emitted during the exploitation and use of raw materials containing mercury whose concentration is present in trace amount. The following subcategories had the largest share in the release of mercury into the environment:

- Combustion of coal in large power plants (250 kg Hg / year)
- Electrical switches and relays with mercury (89 kg Hg / year)
- Dental amalgam fillings (silver fillings) (55 kg Hg / year).

Table 3: Review of mercury releases into the environment ⁵

| Source category | Present source? | | | Estimated mercury input, g Hg / year |
|--|-----------------|---------------|---|--------------------------------------|
| | Y/N/? | Activity rate | Unit | Standard estimate |
| Energy consumption | | | | |
| Coal combustion in large power plants | Y | 1.668.800 | Combusted coal, t / year | 250 |
| Other uses of coal | Y | 89.600 | Used coal, t / year | 12 |
| Combustion / use of petroleum coke and heavy oil | Y | 15.200 | Combusted petroleum product, t / year | 1 |
| Combustion / use of diesel, coal gas, petroleum, kerosene, LPG and other light to medium distillates | Y | 186,600 | Quantity of combusted petroleum product, t / year | 1 |
| Use of raw or previously purified natural gas | N | 0 | Used gas, Nm ³ / year | 0 |
| Use of gas from the gas pipeline (quality for consumers) | N | 0 | Used gas, Nm ³ / year | 0 |
| Energy and heat production from biomass combustion | Y | 554.084 | Combusted biomass, t / year | 17 |
| Combustion of wood charcoal | Y | 14.500 | Combusted wood charcoal, t / year | 2 |
| Fuel production | | | | |
| Oil extraction | N | 0 | Produced fuel oil (mazut) , t / year | 0 |
| Oil processing | N | 0 | Processed fuel oil (mazut) , t / year | 0 |
| Extraction and processing of natural gas | N | 0 | Produced gas, Nm ³ / year | 0 |
| Primary metal production | | | | |
| (Primary) extraction of mercury and initial processing | N | 0 | Produced mercury, t / year | 0 |
| Zinc production from concentrates | N | 0 | Used concentrate, t / year | 0 |
| Copper production from concentrates | N | 0 | Used concentrate, t / year | 0 |

⁵ In order to avoid double counting of mercury inputs from waste and products in the TOTAL value of inputs, this total value of inputs includes only 10% of mercury inputs in sources of waste incineration, waste disposal and illegal disposal. These 10% represent approximately the share of mercury in waste composed of materials that were not individually measured in level 1 of the inventory of this Toolkit. See Appendix 1 to the Inventory Level 1 Guidance for additional explanations.

Estimated quantities include mercury in products which is also included for every product category. To avoid double counting, discharges into land from illegal municipal waste landfills are automatically deducted from the TOTAL amount. Estimated input and discharge into water include quantities of mercury that are also included in every source category. To avoid double counting, input and discharge into the water from the wastewater treatment system is automatically deducted from the TOTAL amounts. In order to avoid double counting of mercury in domestically produced products sold on the domestic market (including oil and gas), only part of the mercury input released from production is included in the input value.

| Source category | Present source? | | | Estimated mercury input, g Hg / year |
|---|-----------------|---------------|--|--------------------------------------|
| | Y/N/? | Activity rate | Unit | Standard estimate |
| Lead production from concentrate | N | 0 | Used concentrate, t / year | 0 |
| Extraction of gold by methods that do not include amalgamation with mercury | N | 0 | Used gold ore, t / year | 0 |
| Alumina production from bauxite (aluminum production) | N | 0 | Processed bauxite, t / year | 0 |
| Primary production of ferrous metals (production of pig iron) | N | 0 | Produced pig iron, t / year | 0 |
| Extraction of gold by amalgamation with mercury - without the use of retort | N | 0 | Produced gold, kg / year | 0 |
| Extraction of gold by amalgamation with mercury - with the use of retort | N | 0 | Produced gold, kg / year | 0 |
| Production of other metals | | | | |
| Cement production | N | 0 | Produced cement, t / year | 0 |
| Pulp and paper production | N | 0 | Biomass used for production, t / year | 0 |
| Production of chemicals | | | | |
| Production of mercury cells chlor-alkali | N | 0 | Produced Cl ₂ , t / year | 0 |
| Production of vinyl chloride monomer (VCM) with mercury catalyst | N | 0 | Produced VCM, t / year | 0 |
| Production of mercury catalyst acetaldehyde | N | 0 | Produced acetaldehyde, t / year | 0 |
| Production of mercury-containing products⁶ | | | | |
| Mercury thermometers (medical, air, laboratory, industrial, etc.) | N | 0 | Mercury used for production, kg / year | 0 |
| Electrical switches and relays with mercury | N | 0 | Mercury used for production, kg / year | 0 |

⁶ In order to avoid double counting of mercury in domestically produced products sold on the domestic market (including oil and gas), only part of the mercury input released from production is included in the input value.

| Source category | Present source? | | | Estimated mercury input, g Hg / year |
|---|-----------------|---------------|--|--------------------------------------|
| | Y/N/? | Activity rate | Unit | Standard estimate |
| Mercury light sources (fluorescent, compact, other: see Guidelines) | N | 0 | Mercury used for production, kg / year | 0 |
| Mercury batteries | N | 0 | Mercury used for production, kg / year | 0 |
| Mercury manometers and mercury measuring instruments | N | 0 | Mercury used for production, kg / year | 0 |
| Mercury biocides and mercury pesticides | N | 0 | Mercury used for production, kg / year | 0 |
| Paints with mercury | N | 0 | Mercury used for production, kg / year | 0 |
| Skin lightening creams and soaps with mercury-containing chemicals | N | 0 | Mercury used for production, kg / year | 0 |
| Use and disposal of mercury-containing products | | | | |
| Dental amalgam fillings (silver fillings) | Y | 633,000 | Population number | 55 |
| Thermometers | Y | 6,721 | Sold items / year | 40 |
| Electrical switches and relays with mercury | Y | 633,000 | Population number | 89 |
| Mercury light sources | Y | 623,011 | Sold items / year | 14 |
| Mercury batteries | Y | 3 | t Sold batteries / year | 8 |
| Polyurethane (PU, PUR) produced with a mercury catalyst | N | 633,000 | Population number | 0 |
| Paints with mercury based preservatives | N | 0 | Sold paint / year | 0 |
| Skin lightening creams and soaps with mercury-containing chemicals | N | 0 | Sold creams or soaps, t / year | 0 |
| Medical instruments for measuring blood pressure (sphygmomanometers with mercury) | Y | 12 | Sold items / year | 1 |
| Other manometers and measuring instruments with mercury | Y | 633,000 | Population number | 3 |
| Laboratory chemicals | Y | 633,000 | Population number | 6 |
| Other laboratory and medical equipment with mercury | N | 633,000 | Population number | 0 |

| Source category | Present source? | | | Estimated mercury input, g Hg / year |
|--|-----------------|----------------------|---|--------------------------------------|
| | Y/N/? | Activity rate | Unit | Standard estimate |
| Production of recycled metals | | | | |
| Recycled mercury production (secondary production) | N | 0 | Produced mercury, kg / year | 0 |
| Production of recycled ferrous metals (iron and steel) | Y | 150 | Number of recycled vehicles / year | 0 |
| Waste incineration | | | | |
| Incineration of municipal waste ^{*6} | N | 0 | Incinerated waste, t / year | 0 |
| Incineration of hazardous waste ^{*6} | N | 0 | Incinerated waste, t / year | 0 |
| Incineration and open incineration of medical waste ^{*6} | N | 0 | Incinerated waste, t / year | 0 |
| Sewage sludge incineration ^{*6} | N | 0 | Incinerated waste, t / year | 0 |
| Incineration of waste in the open (on landfills and illegal landfills) ^{*6} | N | 0 | Incinerated waste, t / year | 0 |
| Waste disposal / Waste disposal on landfills and illegal landfills | | | | |
| Controlled landfills ^{*6} | Y | 138.483 | Waste disposed of at the landfill, t / year | 692 |
| Illegal disposal of municipal waste ^{7*8} | Y | 187.994 ⁹ | Waste illegally disposed of, t / year | 940 |
| Wastewater treatment system ^{*10} | Y | 13.456.000 | Wastewater, m ³ / year | 71 |
| Crematoria and cemeteries | | | | |
| Crematoria | N | 0 | Cremated corpses / year | 0 |
| Cemeteries | Y | 6.329 | Buried corpses / year | 16 |

⁷ In order to avoid double counting of mercury inputs from waste and products in the TOTAL value of inputs, this total value of inputs includes only 10% of mercury inputs in sources of waste incineration, waste disposal and illegal disposal. These 10% represent approximately the share of mercury in waste composed of materials that were not individually measured in level 1 of the inventory of this Toolkit. See Appendix 1 to the Inventory Level 1 Guidance for additional explanations.

⁸ Estimated quantities include mercury in products which is also included for every product category. To avoid double counting, discharges into land from illegal municipal waste landfills are automatically deducted from the TOTAL amount.

⁹ In addition to landfills, in accordance with the Law on Waste Management, waste is also disposed of at temporary municipal waste storage sites. Data on waste quantities are given in the Report on the Implementation of the National Waste Management Plan from 2017.

¹⁰ Estimated input and discharge into water include quantities of mercury that are also included in every source category. To avoid double counting, input and discharge into the water from the wastewater treatment system is automatically deducted from the TOTAL amounts.

| Source category | Present source? | | | Estimated mercury input, g Hg / year |
|---|-----------------|---------------|------|--------------------------------------|
| | Y/N/? | Activity rate | Unit | Standard estimate |
| TOTAL measured emissions ⁵⁶⁷⁸ | | | | 710 |

3.1.3 Mercury emissions

Table 4 shows mercury emissions from all present source categories. Mercury emissions in: air (atmosphere), water (sea and fresh water, through wastewater systems), land, municipal waste and waste treatment by sectors are listed as key emissions. Additional release directions include “by-products and impurities” where mercury is unintentionally returned to the market through by-products containing mercury impurities.

Table 4: Mercury release review and detailed description and definition of release directions

| Source category | Estimated mercury emissions, standard estimates, kg Hg / year | | | | | |
|--|---|-------|------|----------------------------|---------------|--|
| | Air | Water | Land | By-products and impurities | General waste | Processing / waste disposal by sectors |
| Energy consumption | | | | | | |
| Coal combustion in large power plants | 220,3 | 0,0 | 0,0 | 0,0 | 0,0 | 30,0 |
| Coal combustion in coal - fired industrial boilers | - | - | - | - | - | - |
| Other uses of coal | 11,9 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| Combustion / use of petroleum coke and heavy oil | 0,8 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| Combustion / use of diesel, gas coal, 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 previously purified natural gas | - | - | - | - | - | - |
| Use of gas from the gas pipeline (quality for consumers) | - | - | - | - | - | - |
| Energy and heat production from biomass combustion | 16,6 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| Combustion of wood charcoal | 1,7 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| Fuel production | | | | | | |
| Oil extraction | - | - | - | - | - | - |
| Oil processing | - | - | - | - | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| Extraction and processing of natural gas | - | - | - | - | - | - |
| Primary metal production | | | | | | |
| (Primary) extraction of mercury and initial processing | - | - | - | - | - | - |
| Zinc production from concentrates | - | - | - | - | - | - |
| Copper production from concentrates | - | - | - | - | - | - |
| Lead production from concentrate | - | - | - | - | - | - |
| Extraction of gold by methods that do not include amalgamation with mercury | - | - | - | - | - | - |
| Alumina production from bauxite (aluminum production) | - | - | - | - | - | - |
| Primary production of ferrous metals (production of pig iron) | - | - | - | - | - | - |
| Extraction of gold by amalgamation with mercury from the whole ore | - | - | - | - | - | - |
| Extraction of gold by amalgamation with mercury from concentrates | - | - | - | - | - | - |
| Production of other materials | | | | | | |
| Cement production | - | - | - | - | - | - |
| Pulp and paper production | - | - | - | - | - | - |
| Production of chemicals | | | | | | |
| Production of mercury cells chlor-alkali | - | - | - | - | - | - |
| Production of vinyl chloride monomer | - | - | - | - | - | - |

| | | | | | | |
|---|------|------|------|-----|------|------|
| (VCM) with mercury catalyst | | | | | | |
| Production of mercury catalyst acetaldehyde | - | - | - | - | - | - |
| Production of mercury-containing products | | | | | | |
| Mercury thermometers (medical, air, laboratory, industrial, etc.) | - | - | - | - | - | - |
| Electrical switches and relays with mercury | - | - | - | - | - | - |
| Mercury light sources (fluorescent, compact, other: see Guidelines) | - | - | - | - | - | - |
| Mercury batteries | - | - | - | - | - | - |
| Mercury manometers and mercury measuring instruments | - | - | - | - | - | - |
| Mercury biocides and mercury pesticides | - | - | - | - | - | - |
| Paints with mercury | - | - | - | - | - | - |
| Skin lightening creams and soaps with mercury-containing chemicals | - | - | - | - | - | - |
| Use and disposal of mercury-containing products | | | | | | |
| Dental amalgam fillings (silver fillings) | 1,1 | 24,2 | 4,4 | 3,3 | 11,0 | 11,0 |
| Thermometers | 8,0 | 12,0 | 8,0 | 0,0 | 12,0 | 0,0 |
| Electrical switches and relays with mercury | 26,6 | 0,0 | 35,4 | 0,0 | 26,6 | 0,0 |
| Mercury light sources | 4,1 | 0,0 | 4,1 | 0,0 | 5,5 | 0,0 |

| | | | | | | |
|---|-----|-----|-----|-----|-----|-----|
| Mercury batteries | 2,0 | 0,0 | 2,0 | 0,0 | 4,0 | 0,0 |
| Polyurethane (PU, PUR) produced with a mercury catalyst | - | - | - | - | - | - |
| Paints with mercury based preservatives | - | - | - | - | - | - |
| Skin lightening creams and soaps with mercury-containing chemicals | - | - | - | - | - | - |
| Medical instruments for measuring blood pressure (sphygmomanometers with mercury) | 0,2 | 0,3 | 0,2 | 0,0 | 0,3 | 0,0 |
| Other manometers and measuring instruments with mercury | 0,6 | 0,9 | 0,6 | 0,0 | 0,9 | 0,0 |
| Laboratory chemicals | 0,0 | 2,1 | 0,0 | 0,0 | 2,1 | 2,2 |
| Other laboratory and medical equipment with mercury | - | - | - | - | - | - |
| Production of recycled metals | | | | | | |
| Recycled mercury production (secondary production) | - | - | - | - | - | - |
| Production of recycled ferrous metals (iron and steel) | 0,1 | 0,0 | 0,1 | 0,0 | 0,1 | 0,0 |
| Waste incineration | | | | | | |
| Incineration of municipal / general waste | - | - | - | - | - | - |
| Incineration of hazardous waste | - | - | - | - | - | - |
| Incineration and open incineration of medical waste | - | - | - | - | - | - |
| Sewage sludge incineration | - | - | - | - | - | - |
| Incineration of waste in the open | ? | ? | ? | ? | ? | ? |

| | | | | | | |
|--|--------------|--------------|-------------|------------|-------------|-------------|
| (on landfills and illegal landfills) | | | | | | |
| Waste disposal / landfill disposal and wastewater treatment | | | | | | |
| Controlled landfills | 6,9 | 0,1 | 0,0 | - | - | - |
| Illegal disposal of municipal waste *1 | 94,0 | 94,0 | 752,0 | - | - | - |
| Wastewater treatment system | 0,0 | 63,6 | 0,0 | 0,0 | 7,1 | 0,0 |
| Crematoria and cemeteries | | | | | | |
| Crematoria | - | - | - | - | - | - |
| Cemeteries | 0,0 | 0,0 | 15,8 | - | 0,0 | 0,0 |
| TOTAL measured emissions *1*2*3 | 400,0 | 130,0 | 70,0 | 0,0 | 70,0 | 40,0 |

Table 5: Description of release pathways

| Type of calculation results | Description |
|--|---|
| Estimated input value of mercury, kg Hg / year | The standard estimate of the amount of mercury entering this category of input materials, for example, the calculated amount of mercury in coal used in the country annually for combustion in large power plants. |
| Air | Emissions of mercury into the atmosphere from point sources and diffuse sources from which mercury can spread locally or over long distances with air masses. For example, emissions from: point sources such as coal-fired power plants, metal smelters, waste incinerators; diffuse sources, such as illegal incineration of waste containing fluorescent lamps, batteries, thermometers. |
| Water | Discharges of mercury into the aquatic environment and into wastewater treatment systems; point sources and diffuse sources from which mercury will spread to the marine environment (Adriatic Sea) and freshwater systems (rivers, lakes, etc.). For example, emissions from: wet flue gas cleaning systems in coal-fired power plants; industries, households, etc. in aquatic environments; surface runoff and leachate from land and landfills contaminated with mercury. |
| Land | Discharges of mercury into the terrestrial environment: land and groundwater. For example, discharges from: solid residues from flue gas cleaning in coal-fired power plants used to build gravel roads; uncollected waste products, which are illegally disposed of or buried; industries, local uncontrolled discharges, such as storage / burial of hazardous waste in landfills. |
| Municipal waste | It is usually household and industrial waste where the waste undergoes general treatment, such as incineration, landfilling or illegal disposal. Sources of mercury in waste are household products with intentional mercury content (batteries, thermometers, fluorescent tubes, etc.), as well as high-volume |

| | |
|---------------------------------------|--|
| | waste, such as printed paper, plastic, etc., containing a trace amount of mercury. |
| Waste treatment / disposal by sectors | Waste from industry and households that is collected and processed in separate systems, and in some cases recycled. For example: controlled disposal of solid flue gas cleaning residues in coal-fired power plants at designated locations; hazardous industrial waste with a high content of mercury, which is disposed of in designated, safe locations; mercury-containing household hazardous waste, which is usually collected separately and safely processed, and batteries, thermometers, mercury-containing switches, extracted teeth with safely treated amalgam fillings; controlled disposal of tailings and large rocks / waste from non-ferrous metal extraction. |

The subcategories of waste that have the largest share in the release of mercury into the **atmosphere** are:

- coal combustion in large power plants (220.3 kg Hg / year);
- illegal disposal of municipal waste (94 kg Hg / year);
- energy and heat production using biomass (16.6 kg Hg / year);
- other uses of coal (11.9 kg Hg / year);
- mercury-containing electrical switches and relays (6.6 kg Hg / year)

The subcategories of waste that have the largest share in the release of mercury into the water are:

- illegal disposal of municipal waste (94 kg Hg / year);
- wastewater treatment system (63.6 kg Hg / year);
- dental amalgam fillings (24.2 kg Hg / year);
- thermometers (12 kg Hg / year);
- laboratory chemicals (2.1 kg Hg / year)

The subcategories of waste that have the largest share in the release of mercury into the land are:

- illegal disposal of municipal waste (752.0 kg Hg / year);
- mercury-containing electrical switches and relays (35.4 kg Hg / year);
- dental amalgam fillings (4.4 kg Hg / year)

3.2 Data and inventory related to energy consumption and energy production

3.2.1 Coal combustion in large power plants

In Montenegro, coal is used for energy production in coal-fired thermal power plant (Table 6). A small proportion of coal is used in the manufacturing sector and as an energy source for household heating. Data on coal combustion in large power plants were taken from the Complex Energy Balance for 2015, issued by MONSTAT. The total amount of combusted coal (t / year) was **1,668,800** and this amount was taken as the input value in the Toolkit.

Table 6: Detailed results for coal combustion in large power plants

| Coal combustion in large power plants | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|--------------|----------------|--|
| Activity rate | t / year | 1.688.800 | - |
| Phase input factor (Toolkit default value) | g Hg / t | 0,15 | - |
| Calculate the phase contribution | kg Hg / year | 250 | - |
| Distributive release factors for phase: (Toolkit default value): | | | |
| - Air | | 0,88 | - |
| - Water | | 0,00 | - |
| - Land | | 0,00 | - |
| - Products | | 0,00 | - |
| - Municipal waste treatment | | 0,12 | - |
| - Waste treatment by sectors | | 0,00 | - |
| Calculated releases / discharges in: | | | |
| - Air | kg / year | 220,3 | 220,3 |
| - Water | kg / year | 0,0 | 0,0 |
| - Land | kg / year | 0,0 | 0,0 |
| - Products | kg / year | 0,0 | 0,0 |
| - Municipal waste treatment | kg / year | 0,0 | 0,0 |
| - Waste treatment by sectors | kg / year | 30,0 | 30,0 |

The small share of coal consumed annually is used for the manufacturing sector (industry, iron, machinery, food and tobacco, wood and wood products, etc.). Data on other uses of coal are taken from the Complex Energy Balance for 2015. The total amount of coal used (t / year) was 51,000 and this amount was taken as the input value in the Toolkit. The amount of coal used for other uses is only 3% compared to the amount used for combustion in large power plants.

Table 7: Detailed results for other uses of coal

| Other uses of coal | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|--------------|----------------|--|
| Activity rate | t / year | 51.000 | - |
| Phase input factor (Toolkit default value) | g Hg / t | 0,13 | - |
| Calculate the phase contribution | kg Hg / year | 12 | - |
| Distributive release factors for phase: (Toolkit default value): | | | |
| - Air | | 0,99 | - |
| - Water | | 0,00 | - |
| - Land | | 0,00 | - |
| - Products | | 0,00 | - |
| - Municipal waste treatment | | 0,12 | - |
| - Waste treatment by sectors | | 0,00 | - |
| Calculated releases / discharges in: | | | |
| - Air | kg / year | 6,8 | 6,8 |

| Other uses of coal | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|------------------------------|-----------|----------------|--|
| - Water | kg / year | 0,0 | 0,0 |
| - Land | kg / year | 0,0 | 0,0 |
| - Products | kg / year | 0,0 | 0,0 |
| - Municipal waste treatment | kg / year | 0,0 | 0,0 |
| - Waste treatment by sectors | kg / year | 0,0 | 0,0 |

3.2.3 Combustion / use of petroleum coke and heavy oil

Data on this category, as well as on the previous one, were taken from the Complex Energy Balance for 2015. The total amount of petroleum products (residual fuel oil and fuel oil - mazut) that is combusted annually is **14,400 t / year**.

Table 8: Detailed results for the combustion / use of petroleum coke and heavy oil

| Combustion / use of petroleum coke and heavy oil | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|--------------|----------------|--|
| Activity rate | t / year | 14.400 | - |
| Phase input factor (Toolkit default value) | mg Hg / t | 55 | - |
| Calculated input value for phase | kg Hg / year | 1 | - |
| Calculated releases / discharges in: | | | |
| - Air | kg / year | 0,8 | 0,8 |
| - Water | kg / year | 0,0 | 0,0 |
| - Land | kg / year | 0,0 | 0,0 |
| - Products | kg / year | 0,0 | 0,0 |
| - Municipal waste treatment | kg / year | 0,0 | 0,0 |
| - Waste treatment by sectors | kg / year | 0,0 | 0,0 |

3.2.4 Combustion / use of diesel, gas coal, petroleum, kerosene

Petroleum products are mainly intended for the transport, industry, production and to a lesser extent, for households (LPG and kerosene), trade and agriculture. Liquefied petroleum gas (LPG) is mainly used as an energy source in industry and as a fuel for vehicles. Data on this category were taken from the Complex Energy Balance for 2015. Consumption for 2015 (combination of motor gasoline, gas / diesel oil, kerosene and LPG) was **246,400 t / year**.

Table 9: Detailed results for the combustion / use of diesel, gas coal, petroleum, kerosene

| Combustion / use of diesel, gas coal, petroleum, kerosene | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|---|--------------|----------------|--|
| Activity rate | t / year | 246.400 | - |
| Phase input factor (Toolkit default value) | mg Hg / t | 5,5 | - |
| Calculate the phase contribution | Kg Hg / year | 1 | - |
| Calculated releases / discharges in: | | | |
| - Air | kg / year | 1,3 | 1,3 |
| - Water | kg / year | 0,0 | 0,0 |
| - Land | kg / year | 0,0 | 0,0 |
| - Products | kg / year | 0,0 | 0,0 |
| - Municipal waste treatment | kg / year | 0,0 | 0,0 |
| - Waste treatment by sectors | kg / year | 0,0 | 0,0 |

3.2.5 Use of raw or previously purified natural gas

Currently, raw or previously purified gas is not used, because Montenegro does not produce natural gas, there is no gas pipeline for the transmission of natural gas through Montenegro. However, natural gas and oil exploration in the Montenegrin part of the Adriatic Sea is planned in the future.

3.2.6 Use of gas from the gas pipeline (quality for consumers)

There is no gas pipeline in Montenegro.

3.2.7 Energy and heat production from biomass combustion

Data on energy and heat production from biomass combustion were taken from the Complex Energy Balance for 2015. The total amount of biomass that is combusted annually is 768,453 m³ / year. (554 t / year calculated on the basis of the average wood density in Montenegro, which is 0.7209 t / m³). When it comes to biomass used for combustion, most biomass refers to firewood. It should be noted that a large number of households, especially in the north of the country, use firewood as an energy source for heating houses.

Table 10: Energy and heat production from biomass combustion

| Energy and heat production from biomass combustion | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|--------------|----------------|--|
| Activity rate | t / year | 554 | - |
| Phase input factor (Toolkit default) | g Hg / t | 0,03 | - |
| Calculate the phase contribution | kg Hg / year | 17 | - |
| Calculated releases / discharges in: | | | |
| - Air | kg / year | 0,02 | 0,02 |
| - Water | kg / year | 0,0 | 0,0 |
| - Land | kg / year | 0,0 | 0,0 |
| - Products | kg / year | 0,0 | 0,0 |

| Energy and heat production from biomass combustion | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|-----------|----------------|--|
| - Municipal waste treatment | kg / year | 0,0 | 0,0 |
| - Waste treatment by sectors | kg / year | 0,0 | 0,0 |

3.2.8 Combustion of wood charcoal

A small share of coal consumed annually is used to heat households (0.9% compared to the amount used in combustion in large power plants). Data on wood charcoal combustion are taken from the Complex Energy Balance for 2015. The total amount of wood charcoal combusted annually was **818 t / year**.

Table 11: Combustion of wood charcoal

| Combustion of wood charcoal | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|---|--------------|----------------|--|
| Activity rate | t / year | 818 | - |
| Phase input factor (Toolkit default value) | g Hg / t | 0,12 | - |
| Calculate the phase contribution | kg Hg / year | 2 | - |
| Calculated releases / discharges in: | | | |
| - Air | kg / year | 0,1 | 0,1 |
| - Water | kg / year | 0,0 | 0,0 |
| - Land | kg / year | 0,0 | 0,0 |
| - Products | kg / year | 0,0 | 0,0 |
| - Municipal waste treatment | kg / year | 0,0 | 0,0 |
| - Waste treatment by sectors | kg / year | 0,0 | 0,0 |

3.2.9 Fuel production (oil extraction, oil processing and extraction and processing of natural gas)

Oil is not currently extracted or processed in Montenegro; however, natural gas and oil exploration is currently being conducted in the Montenegrin part of the Adriatic Sea.

3.3 Data and inventory related to domestic production of metals and raw materials

There is no domestic production of metals and raw materials in Montenegro, which could directly or indirectly lead to the release of mercury. Montenegro used to have primary production of ferrous metal (wrought iron production) at the Nikšić Ironworks, however, this sector of production has ceased to operate and currently only secondary production of metal from recycled materials (production of iron bars) takes place. In addition, the production of alumina from bauxite used to take place in the Aluminum Plant Podgorica (KAP). In Montenegro, cement distributors are present only in small bags. As far as pulp and paper production is concerned, only paper recycling takes place. Also, Montenegro does not produce jewelry, so mercury is not used for those purposes.

3.4 Data and inventory related to domestic production and processing in case of intentional use of mercury

There is no domestic production of chemicals in Montenegro, which implies the use of mercury as a catalyst or mercury cells. In addition, vinyl chloride monomer (VCM) is not produced. Also, mercury-containing products (such as mercury thermometers, mercury light sources, mercury manometers / measuring instruments, mercury biocides and pesticides, mercury batteries, mercury paints or skin lightening creams and soaps with mercury) are not produced.

3.4.1 Production of chemicals

All chemicals containing mercury are imported and are mostly used in laboratories or for scientific research. The main importers of these chemicals are the Center for Ecotoxicological Research LLC Podgorica and the Institute of Public Health (IPH), but this amount is negligible.

Table 12: List of chemicals imported in 2015

| Year | Product | Use | Quantity | Importer | Type of activity |
|------|-----------------------------|--------------------|----------|----------|------------------------|
| 2015 | Standard laboratory mercury | Elemental mercury | 500 ml | IPH | Examination / research |
| 2015 | Standard laboratory mercury | Elemental mercury | 500 ml | CETI | Examination / research |
| 2015 | mercury (II) sulphate | Laboratory reagent | 500 g | CETI | Examination / research |
| 2015 | mercury (II) sulphate | Laboratory reagent | 500 g | CETI | Examination / research |

3.4.2 Production of mercury-containing products

Montenegro does not produce chemicals, so there is no need for mercury catalysts or mercury cells. There are no business entities registered for that purpose in the Central Register of Business Entities. Montenegro does not produce mercury-containing products, such as thermometers, light sources, manometers / measuring instruments, biocides and pesticides, batteries, paints or creams and soaps for lightening the skin. All these products available in the market are imported. All mercury-containing chemicals are imported and are primarily used for laboratory or scientific research.

3.5 Waste management and recycling data and inventory

Review of mercury discharges into by-products and impurities

The main sources of mercury emissions are coal combustion and other uses of coal, with an estimated 262 kg of mercury per year, followed by the use and disposal of other products with 210 kg of mercury per year, followed by illegal disposal of municipal waste (940 kg of mercury per year) and waste disposal (692 kg of mercury per year). Other important sources with significantly

lower emissions are: wastewater treatment system (71 kg), application, use and disposal of dental amalgam fillings (55 kg) and combustion of other fossil fuels / biomass (20 kg).

Review of mercury discharges into general waste

One of the main sources of mercury emission is “use and disposal of other products” with 210 kg of mercury per year, followed by illegal disposal of municipal waste (940 kg of mercury per year) and waste disposal (692 kg of mercury per year).

3.5.1 Recycled mercury production (“secondary production”)

Recycled mercury is not produced in Montenegro.

3.5.2 Production of recycled ferrous metals (iron and steel)

Montenegro produces recycled ferrous metals. The registered number of recycled vehicles in 2015 was 150 (data source: Landfill LTD - Podgorica and Nikšić Recycling Center). Table 13 shows the results for the production of recycled ferrous metals (iron and steel).

Table 13: Results for the production of recycled ferrous metals (iron and steel)

| Production of recycled ferrous metals (iron and steel) | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|------------------------------------|----------------|--|
| Activity rate | Number of recycled vehicles / year | 150 | - |
| Phase input factor | g Hg / vehicles | 1 | - |
| Calculate the phase contribution | kg Hg / year | 0,15 | - |
| Calculated releases / discharges in: | | | |
| - Air | kg / year | 0,1 | 0,1 |
| - Water | kg / year | 0,0 | 0,0 |
| - Land | kg / year | 0,1 | 0,1 |
| - Products | kg / year | 0,0 | 0,0 |
| - Municipal waste treatment | kg / year | 0,1 | 0,1 |
| - Waste treatment by sectors | kg / year | 0,0 | 0,0 |

3.5.3 Incineration of municipal waste

There is no municipal waste incinerator in Montenegro. The collected waste is disposed of in a sanitary tub, which is closed in an appropriate manner when the estimated capacity for which it is designed is met.

3.5.4 Incineration of hazardous waste

Montenegro does not incinerate hazardous waste and it does not have landfills designed to accept hazardous waste. Therefore, the management of this waste is performed by companies that are specially registered for the collection, disposal and export of hazardous waste.

In order to comply with European Union standards, Montenegro has undertaken all activities related to the legal framework, economic interests and hierarchy in waste management. Waste

management in Montenegro is regulated by the Law on Waste Management and other secondary legislation that regulate and prescribe measures to protect the environment from the harmful effects of waste, including hazardous waste. Once collected, hazardous waste is carefully stored in accordance with the law at a designated location, and then exported to European Union countries where it is processed and incinerated, in accordance with the requirements of the Basel Convention.

3.5.5 Incineration and open incineration of medical waste

Montenegro does not incinerate or openly incinerate medical waste. It should also be noted that there are facilities designed to convert medical waste into non-hazardous waste at the Clinical Center in Podgorica and the General Hospital in Berane. Medical waste, such as needles, syringes, catheters, etc., is first sterilized at 135 ° C, then ground and disposed of in sanitary landfills.

3.5.6 Sewage sludge incineration

There is no incineration of sewage sludge in Montenegro, but there are four wastewater treatment plants (Podgorica, Nikšić, Budva and one joint plant for the municipalities of Kotor and Tivat). Prior to storage, the sewage sludge is fermented, dried and finally pressed into blocks.

3.5.7 Incineration of waste in the open (on landfills and illegal landfills)

There are two sanitary landfills in Montenegro (Landfill LTD - Podgorica and Možura LTD - Bar). Most of the municipal waste collected at these two sites will not be incinerated by open burning. Waste at controlled landfills accounts for 42.4% of waste compared to illegal disposal of municipal waste.

3.5.8 Controlled landfills

The total amount of municipal waste collected by the companies Landfill LTD - Podgorica and Možura LTD - Bar in 2015 was **138,483** tons. The data were officially obtained from the companies Landfill LTD - Podgorica and Možura LTD - Bar. Mercury from the landfills can be released into the environment in three directions: into the air via landfill gas from the landfill and the working face of the landfill; into the water through leachate; into the land through the accumulation of all mercury waste. Based on the standard factor, it was estimated that the share of mercury in waste in 2015 was 692 kg / year. Estimated mercury releases from this source in 2015 were 6.9 kg / year into the air and 0.1 kg / year into the water.

Table 14: Results for disposal at controlled landfills

| Controlled landfills | Unit | Production | Use | Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|----------------------------------|--------------|------------|-----|----------|--|
| Activity rate | t / year | | | 138.483 | - |
| Phase input factor | g Hg / t | | | 5 | - |
| Calculate the phase contribution | kg Hg / year | | | 692 | - |

| Controlled landfills | Unit | Production | Use | Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|------|------------|-----|----------|--|
| Distributive release factors for phase: | | | | | |
| - Air | | | | 0,01 | - |
| - Water | | | | 0,0001 | - |
| - Land | | | | - | - |
| - Products | | | | - | - |
| - Municipal waste treatment | | | | - | - |
| - Waste treatment by sectors | | | | - | - |
| Calculated releases / discharges in: | | | | | |
| - Air | | | | 6,9 | 6,9 |
| - Water | | | | 0,1 | 0,1 |
| - Land | | | | 0,0 | 0,0 |
| - Products | | | | 0,0 | 0,0 |
| - Municipal waste treatment | | | | 0,0 | 0,0 |
| - Waste treatment by sectors | | | | 0,0 | 0,0 |

3.5.9 Illegal disposal of municipal waste

The total amount of generated municipal waste in 2015 was 326,447¹¹ tons. Illegal disposal of municipal waste accounted for 57.6% of disposed municipal waste in Montenegro in 2015. In the Toolkit, illegal disposal of waste means direct discharges into the land that lead to discharges into the air and water. Detailed results for illegal disposal of municipal waste are presented in Table 15.

Table 15: Results for illegal disposal of municipal waste

| Illegal disposal | Unit | Production | Use | Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|----------------------------------|--------------|------------|-----|----------|--|
| Activity rate | t / year | | | 187.994 | - |
| Phase input factor | g Hg / t | | | 5 | - |
| Calculate the phase contribution | kg Hg / year | | | 940 | - |

¹¹ The source of data is MONSTAT - Publication for municipal waste in 2015

| | | | | | |
|--|--|--|--|-------|--------------|
| Distributive release factors for phase: | | | | | |
| - Air | | | | 0,1 | - |
| - Water | | | | 0,1 | - |
| - Land | | | | 0,8 | - |
| - Products | | | | - | - |
| - Municipal waste treatment | | | | - | - |
| - Waste treatment by sectors | | | | - | - |
| Calculated releases / discharges in: | | | | | |
| - Air | | | | 94,0 | 94,0 |
| - Water | | | | 94,0 | 94,0 |
| - Land | | | | 752,0 | 752,0 |
| - Products | | | | - | |
| - Municipal waste treatment | | | | - | |
| - Waste treatment by sectors | | | | - | |

3.5.10 Wastewater treatment system

There are four wastewater treatment plants in Montenegro: Podgorica, Budva, Nikšić and Kotor / Tivat. All plants consist of mechanical and biological treatment (activated sludge), with final production of sludge. Wastewater from households and companies connected to the sewage system is treated in these four plants. Table 17 shows the amount of wastewater treated in wastewater treatment plants in Montenegro, while Table 16 shows the time trends for the volume of wastewater treated in Montenegro.¹²

Table 16: Trend of the volume of wastewater treated in Montenegro

| Volume of the treated wastewater (million m ³ / year) | | | | |
|--|--------|--------|--------|--------|
| 2002 | 2005 | 2008 | 2011 | 2014 |
| 26,639 | 11,619 | 15,317 | 19,964 | 14,643 |

According to the Statistical Yearbook for 2016, published by MONSTAT, the volume of wastewater treated in Montenegro in 2015 amounted to **13,456,000 m³ / year**.

¹² Statistical Yearbook for 2016, published by MONSTAT

Tabela 17: Results for wastewater treatment

| Wastewater | Unit | Production | Use | Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|------------------------|------------|-----|------------|--|
| Activity rate | m ³ / year | | | 13.456.000 | - |
| Phase input factor | mg Hg / m ³ | | | 5,25 | - |
| Calculate the phase contribution | kg Hg / year | | | 71 | - |
| Distributive release factors for phase: | | | | | |
| - Air | | | | - | - |
| - Water | | | | 0,5 | - |
| - Land | | | | 0,2 | - |
| - Products | | | | - | - |
| - Municipal waste treatment | | | | 0,15 | - |
| - Waste treatment by sectors | | | | - | - |
| Calculated releases / discharges in: | | | | | |
| - Air | | | | 0,0 | 0,0 |
| - Water | | | | 63,6 | 63,6 |
| - Land | | | | 0,0 | 0,0 |
| - Products | | | | - | 0,0 |
| - Municipal waste treatment | | | | 7,1 | 7,1 |
| - Waste treatment by sectors | | | | 0,0 | 0,0 |

3.6 Data and inventory related to the total consumption of mercury in products such as metallic mercury and mercury-containing substances

3.6.1 Thermometers and other glass thermometers containing mercury (for air, laboratories, dairies, etc.)

In industry, mercury is most commonly used in thermometers. The reason for its use is that mercury is the only metal that is in a liquid state at room temperature, and since all metals expand in heat, they can accurately measure temperatures if placed in a calibrated glass container. Mercury thermometers are not produced in Montenegro. All thermometers are imported. The Harmonized System (HS 9025111000) tariff code for mercury-containing clinical thermometers was not found in the customs import documentation. HS tariff code 90251100 was used to identify “thermometers, not combined with other instruments, liquid-filled for direct reading”. National mercury-specific sub-numbers are available (shown in Table 18).

Table 18: Thermometers, not combined with other instruments, liquid-filled for direct reading

| HS tariff code | HS tariff code description | Total amount | Included in inventory |
|---------------------|---|--------------|-----------------------|
| Thermometers | | | |
| 9025 1120 | Mercury-containing medical thermometers | 3.683 items | Yes |
| 9025 1180 | Other glass thermometers (for air, laboratories, dairies, etc.) | 3.038 items | Yes |

Table 19 shows detailed results for thermometers.

Table 19: Detailed results for mercury thermometers

| Mercury thermometers | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|--------------|----------------|--|
| Activity rate | items / year | 6.721 | - |
| Phase input factor (medical thermometers) | g Hg / items | 1 | - |
| Phase input factor (other glass thermometers) | g Hg / items | 12 | - |
| Calculate the phase contribution | kg Hg / year | 6.721 | - |
| Distributive release factors for phase: | | | |
| - Air | | 0,1 | - |
| - Water | | 0,3 | - |
| - Land | | 0,00 | - |
| - Products | | | - |
| - Municipal waste treatment | | 0,6 | - |
| - Waste treatment by sectors | | 0,00 | - |
| Calculated releases / discharges in: | | | |
| - Air | kg / year | 8,0 | 8,0 |
| - Water | kg / year | 12,0 | 12,0 |
| - Land | | 8,0 | 8,00 |
| - Products | | 0,0 | 0,0 |
| - Municipal waste treatment | kg / year | 12,0 | 12,0 |
| - Waste treatment by sectors | | 0,0 | 0,00 |

3.6.2 Electrical switches and relays

Switches are devices that open or close a circuit, or a liquid or gas valve. Mercury-containing switches are: float switches that operate by changing the liquid level; tilt switches that operate by changing the position of the switch; pressure switches that operate by changing the pressure; and temperature switches and flame sensors, which operate by changing the temperature. Mercury-containing switches are used in a variety of consumer, commercial and industrial products, including: white goods, space heaters, ovens, air preparation units, train security systems, leveling devices, lights in the hoods of some older cars and pumps.

Relays are products or devices that open or close electrical contacts in order to control the operation of other devices in the same or another electrical circuit. Relays are often used to turn

high / medium current loads on or off by delivering relatively low current to the control circuit. Mercury-containing relays are: mercury switch relays, mercury-soaked electromagnetic relays, mercury contact relays. Relays are used in telecommunication conductors, electric stoves in commercial / industrial use and other cooking equipment¹³.

Due to the uncertainty regarding the distribution of mercury-containing switches and relays in Montenegro, the standard method established in the Toolkit was applied in the inventory, according to which it is assumed that 0.14 g of mercury per capita falls in this category of sources. The application of this method has led to the fact that the highest input of mercury was **88.6** kg per year, which is overestimated and true only if the mercury-containing switches have been gradually replaced in Montenegro in the past 10 years. Most of this mercury would be discharged into municipal waste treatment (Table 20).

Table 20: Detailed results for electrical switches and relays

| Electrical switches and relays | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|-------------------|----------------|--|
| Activity rate | Population | 633.000 | - |
| Phase input factor | g Hg / per capita | 0,14 | - |
| Calculate the phase contribution | kg Hg / year | 88,6 | - |
| Distributive release factors for phase: | | | |
| - Air | - | 0,1 | - |
| - Water | - | | - |
| - Land | - | 0,1 | - |
| - Products | - | | - |
| - Municipal waste treatment | - | 0,8 | - |
| - Waste treatment by sectors | - | | - |
| Calculated releases / discharges in: | | | |
| - Air | kg / year | 26,6 | 26,6 |
| - Water | kg / year | 0,00 | 0,00 |
| - Land | kg / year | 35,4 | 35,4 |
| - Products | kg / year | 0,00 | 0,00 |
| - Municipal waste treatment | kg / year | 26,6 | 26,6 |
| - Waste treatment by sectors | kg / year | 0,00 | 0,00 |

3.6.3 Mercury light sources

An example of a light source that uses mercury is a mercury gas discharge lamp, which is still common in street lighting, which uses electricity to convert mercury into steam and conduct electricity in gas (electric arc) thus producing light. Other commonly used lighting includes fluorescent lamps. These lamps use electricity to stimulate mercury atoms, releasing UV light,

¹³ http://www.newmoa.org/prevention/mercury/imerc/factsheets/switches_relays_2014.pdf

which leads to formation of a layer of phosphorus inside the glass, causing it to become "fluorescent" and produce light. Mercury is present in both phosphorus powder and vapor. The same technology can be found in fluorescent lamps (CFLs) and other energy efficient lamps (CFLs, but not in LED lamps). There is no production capacity for the production of light sources in Montenegro. All lamps are imported from abroad.

HS tariff codes are shown in Table 21 and show product categories that include mercury products. In the argument for each of these HS tariff codes, it has already been described that the HS code does not cover all mercury-containing items. In addition, the mercury content of each of these products varies depending on their size, brand, etc.

Table 21: Mercury light sources

| Applied HS tariff code | Description of the product type in the Toolkit | Total amount | Included in inventory |
|------------------------------|---|---------------|-----------------------|
| Mercury light sources | | | |
| 853931 | Fluorescent tubes (double-ended) | 440.564 items | Yes |
| 853931 | Compact fluorescent lamp (CFL with one end) | 110.141 items | Yes |
| 853932 | Other light sources containing mercury (see Guidelines) | 72.306 items | Yes |

Combining all figures related to mercury lamps in Montenegro (623,011), 70.7% are fluorescent tubes (440,564), 17.7% CFL (110,141) and 11.6% other mercury-containing lamps (72,306). Table 22 shows detailed results for fluorescent tubes and CFLs.

Table 22: Results for fluorescent tubes and CFLs

| Mercury-containing light sources | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|---------------|----------------|--|
| Fluorescent tube activity rate | items / year | 445.564 | - |
| Phase input factor | mg Hg / items | 25 | - |
| Calculate the phase contribution | kg Hg / year | 11,1 | - |
| CFL activity rate | items / year | 110.141 | - |
| Phase input factor | mg Hg / items | 10 | - |
| Calculate the phase contribution | kg Hg / year | 1,1 | - |
| Distributive release factors for phase: | | | |
| - Air | - | 0,05 | - |
| - Water | - | | - |
| - Land | - | 0,05 | - |
| - Products | - | | - |
| - Municipal waste treatment | - | 0,95 | - |
| - Waste treatment by sectors | - | | - |

| Mercury-containing light sources | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|---|------|----------------|--|
| Calculated output value / discharges in: | | | |
| - Air | | 4,1 | 4,1 |
| - Water | | 0,00 | 0,00 |
| - Land | | 4,1 | 4,1 |
| - Products | | 0,00 | 0,00 |
| - Municipal waste treatment | | 5,5 | 5,5 |
| - Waste treatment by sectors | | 0,00 | 0,00 |

Fluorescent tubes contain more mercury than CFLs, but in order to more accurately estimate the prevalence of different types of lamps, information must be obtained from sources other than export documentation (e.g. from distributors).

3.6.4 Mercury batteries

There are various button batteries that contain mercury, including zinc-air batteries, silver oxide batteries and alkaline batteries with manganese oxide. Button batteries are small, thin, energy cells that cannot be recharged. They are most often used in watches, toys, hearing aids and other small and portable electronic devices. The production of small electronic devices is possible thanks to the size of button batteries. Below is a brief description of the types of relevant batteries that can be found on the market.

- **Zinc-air miniature batteries** are mainly used in hearing aids due to their high energy concentration and ability to continuously release energy. This type of battery uses oxygen from the air to produce electrochemical energy. A small opening in the cell allows the air to enter the battery and react with the cathode. They are also used for small devices, such as wristwatch pagers and in-ear speech processors.
- **Silver oxide button batteries** are used in a variety of devices, such as hearing aids, watches, cameras, and wall clocks. In these batteries, silver oxide is the cathode, while zinc powder is the anode. Sodium hydroxide or potassium hydroxide is usually added as the alkaline electrolyte. Silver oxide batteries can be found in larger shapes as well as in button sizes; however, the production of larger batteries is limited due to the high price of silver.
- **Alkaline button batteries with manganese oxide** are used in toys, calculators, remote controls and cameras. In these batteries, the cathode consists of manganese dioxide, which is produced in an electrolytic process, and anodes composed of zinc metal powder. The electrolyte commonly used for this type of button battery is potassium hydroxide. In all these forms of button batteries, gas can form as a result of zinc corrosion. The zinc in the battery corrodes into electrolyte during the period of battery use. This corrosion can cause electrolysis and the formation of hydrogen in the form of gas in the cylinder. Accumulated hydrogen in the gas can cause the battery to leak, as well as limit the battery's ability to function. Mercury suppresses zinc corrosion, which is why it is added to button batteries. These batteries may contain mercury in the insulating paper surrounding the battery, or the mercury may mix in the anode itself.
- **Mercury oxides** contain mercury as an electrode and are useful in applications that require high energy density and a uniform voltage curve. Before, mercury oxide button batteries were used for hearing aids, watches, calculators, electronic cameras and other similar electronic items on the European market that needed a small battery.

- **Other batteries** - such as alkaline batteries AAA, AA, C, and D, for general use, and zinc-carbon; lead-acid; lithium-ionic; nickel metal hydride and nickel-cadmium batteries - do not contain mercury.

These button batteries can contain up to 0.005 grams (5 milligrams) of mercury per unit. Lined button batteries (that is, units that contain multiple button batteries lined up on top of each other) may contain more mercury¹⁴. Batteries are not produced in Montenegro. All battery products are imported. Data obtained from the Revenue and Customs Administration for 2015 indicate that there is no use of mercury oxide in button cells and other sizes, which are also called mercury-zinc cells. On the other hand, in Montenegro, about 1 t of other button cells (zinc-air, alkaline button cells, silver oxide) and about 1 t of other mercury batteries (ordinary cylindrical alkaline, permanganate, etc.) were in use.

3.6.5 Paints with mercury

Phenylmercury acetate (PMA) and similar mercury compounds were used as color additives with water as the base. These additives extend the expiration date by controlling bacterial fermentation in cans (biocides), as well as to repel fungal attacks on colored surfaces in humid conditions (fungicides). Inorganic mercury compounds of very high solubility have also been used as additives in vessel coatings and paints, to prevent the formation of bacteria and stop the appearance of marine organisms.¹⁵ Mercury paints are not produced or imported in Montenegro.

3.6.6 Cosmetics containing mercury

Mercury is a common ingredient in soaps and skin lightening creams. It is also found in other cosmetic products, such as decorative cosmetics for the eyes and eyelashes, and facial cleansing products. Mercury salts inhibit the formation of melanin, thus creating a lighter skin tone. Mercury in cosmetics occurs in two forms: inorganic and organic. Inorganic mercury (e.g. ammoniated mercury) is used in soaps and skin lightening creams. Organic mercury compounds (thiomersal [ethyl mercury] and phenyl-mercury salts) are used as cosmetic preservatives in decorative cosmetics for eyes and eyelashes and facial cleansing products.¹⁶ Decorative cosmetics are not produced in Montenegro and according to the information available at the time of making the inventory, there is no import / use of cosmetics containing mercury.

3.6.7 Dental amalgam fillings with mercury

Dental amalgam is a dental filling used to fill cavities caused by dental caries. It has been used for over 150 years in hundreds of millions of patients worldwide. Dental amalgam is a mixture of metals, and consists of liquid (elemental) mercury and a powder alloy consisting of silver, tin and copper. About 50% of the weight of dental amalgam is mercury. The chemical properties of elemental mercury allow it to react with silver / copper / tin alloy particles and bind to them, forming an amalgam. Dental amalgam fillings are also called “silver fillings” because they resemble silver. Despite that name, “silver fillings” do not contain elemental mercury.¹⁷ Mercury amalgams are not produced in Montenegro; however, as found in the Toolkit, “production” in this context involves in situ preparation at a dental clinic. The level 1 estimate is based on the ratio between the dental staff and the population, which for Montenegro is 0.36 per 1,000 citizens. Table 23 shows that **55**

¹⁴ <http://www.newmoa.org/prevention/mercury/imerc/factsheets/batteries.cfm>

¹⁵ http://www.zeromercury.org/index.php?option=com_content&view=article&id=142&Itemid=91

¹⁶ http://www.who.int/ipcs/assessment/public_health/mercury_flyer.pdf

¹⁷ <http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/DentalProducts/DentalAmalgam/ucm171094.htm>

kg of mercury comes from this source category and that the largest share is released into the water.

Table 23: Detailed results for dental amalgam fillings

| Dental amalgam | Unit | Production | Use | Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|--------------------------|------------|---------|----------|--|
| Activity rate | population | 633.000 | 633.000 | 633.000 | - |
| Phase input factor | g Hg / citizens per year | 0,087 | 0,087 | 0,087 | - |
| Calculate the share in phase | kg Hg / year | 55 | 55 | 55 | - |
| Distributive release factors for phase: | | | | | |
| - Air | | 0,02 | | | - |
| - Water | | 0,14 | 0,02 | 0,3 | - |
| - Land | | | | 0,08 | - |
| - Products | | | | 0,06 | - |
| - Municipal waste treatment | | 0,12 | | 0,08 | - |
| - Waste treatment by sectors | | 0,12 | | 0,08 | - |
| Calculated releases / discharges in: | | | | | |
| - Air | kg / year | 1,1 | 0,00 | 0,00 | 1,1 |
| - Water | kg / year | 7,7 | 1.1 | 15,4 | 24,2 |
| - Land | kg / year | 0,00 | 0,00 | 4,4 | 4,4 |
| - Products | kg / year | 0,00 | 0,00 | 3,3 | 3,3 |
| - Municipal waste treatment | kg / year | 6,6 | 0,00 | 4,4 | 11,0 |
| - Waste treatment by sectors | kg / year | 6,6 | 0,00 | 4,4 | 11,0 |

3.6.8 Polyurethane with a mercury catalyst

Polyurethane (PUR) is a polymer obtained from the reaction between polyhydroxy alcohol (polyol) and isocyanate (R-NCO). The bonds that are result of this reaction are carbamate (urethane) bonds, and the polymerization product is polyurethane. It has many applications, including the automotive industry, where it is used in the production of stabilizer clips, seat pads, etc. In the production process, organic mercury compounds are used as a catalyst.¹⁸ Polyurethane products are not produced in Montenegro, and it is not known whether some of the imported products with polyurethane elastomers contain mercury.

¹⁸ http://www.zeromercury.org/index.php?option=com_content&view=article&id=190&Itemid=117

3.6.9 Manometers and measuring instruments containing mercury

The density of mercury is 13,600 kg / m³, compared to water of 1,000 kg / m³, so a column of mercury which is 760 mm high can balance atmospheric pressure; it is equivalent to a water column which is 10 m high. For this reason, mercury is used in manometers and instruments measuring pressure. In Montenegro, it is most commonly used in blood pressure monitors, also called sphygmomanometers. Manometers and measuring instruments are not produced in Montenegro. All these products are imported from abroad. Import data from 2014 were checked to confirm this finding under HS tariff code 90262000 entitled "Instruments and devices for measuring or checking blood pressure", where the following three categories are used: device for monitoring blood pressure, "device for measuring blood pressure" and "digital blood pressure monitor" (no longer used). It was established that in 2015, 12 such items were imported. Table 24 shows that this category produces 1 kg of mercury, and it is calculated that the largest share is released during the treatment of municipal waste.

Tabela 24: Detailed results for manometers and measuring instruments containing mercury

| Manometers and measuring instruments | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|--------------|----------------|--|
| Activity rate | items | 12 | - |
| Phase input factor | g / items | 80 | - |
| Calculate the phase contribution | kg Hg / year | 3 | - |
| Distributive release factors for phase: | | | |
| - Air | | 0,1 | - |
| - Water | | 0,3 | - |
| - Land | | | - |
| - Products | | | - |
| - Municipal waste treatment | | 0,6 | - |
| - Waste treatment by sectors | | | - |
| Calculated releases / discharges in: | | | |
| - Air | kg / year | 0,6 | 0,6 |
| - Water | kg / year | 0,9 | 0,9 |
| - Land | kg / year | 0,6 | 0,6 |
| - Products | kg / year | 0,00 | 0,00 |
| - Municipal waste treatment | kg / year | 0,9 | 0,9 |
| - Waste treatment by sectors | kg / year | 0,00 | 0,00 |

3.6.10 Laboratory chemicals

Mercury is used in laboratories for demonstration and education purposes when density tests are conducted. It is also used as a preservative in reagents, buffers, stains and saline solutions. It is also often found in analytical equipment, such as atomic absorption spectrometry (AAS) and mercury electrodes (calomel), as a reference cathode in electrochemical applications. There are certain types of laboratories in Montenegro: research, industrial and testing. Research laboratories are located in institutions (CETI, IPH) and they use small amounts of mercury for research purposes. Industrial laboratories conduct tests on the quality standards of manufactured products, wastewater, etc., but there is no data on whether they use chemicals that contain mercury.

The results show that the annual amount is **6** kg of mercury, and it is primarily discharged into water, treatment of municipal waste and waste by sectors.

The Toolkit presents an additional calculation for “other laboratory equipment”, which consists of a list of chemicals containing mercury, but based on available data, it is concluded that this equipment does not exist in Montenegro.

Table 25: Detailed results for Laboratory chemicals

| Laboratory chemicals | Unit | Use + Disposal | The sum of the emissions in the directions of movement from the estimated part of the life cycle |
|--|---------------------|----------------|--|
| Activity rate | Population | 633.000 | - |
| Phase input factor | g/citizens per year | 0,01 | - |
| Calculate the phase contribution | kg Hg / year | 6 | - |
| Distributive release factors for phase: | | | |
| - Air | | - | - |
| - Water | | 0,33 | - |
| - Land | | | - |
| - Products | | | - |
| - Municipal waste treatment | | 0,33 | - |
| - Waste treatment by sectors | | 0,34 | - |
| Calculated releases / discharges in: | | | |
| - Air | kg / year | 0,00 | 0,00 |
| - Water | kg / year | 2,1 | 2,1 |
| - Land | kg / year | 0,00 | 0,00 |
| - Products | kg / year | 0,00 | 0,00 |
| - Municipal waste treatment | kg / year | 2,1 | 2,1 |
| - Waste treatment by sectors | kg / year | 2,2 | 2,2 |

3.7 Stocks of mercury and / or mercury compounds and storage conditions

Not applicable in Montenegro.

Chapter IV: Identification of groups at risk and gender dimensions

4.1 Preliminary analysis of possible groups at risk and possible health risks

There are groups of people who are more susceptible to the effects of mercury, that is, those who are more sensitive to the effects of mercury and those who are exposed to high levels of mercury. The target groups are defined as fetuses, newborns and children, since they are particularly susceptible, due to the sensitivity of the developing nervous system. In addition to *in utero* exposure, newborns may be additionally exposed through breast milk contaminated with mercury, although only a small percentage of mercury from the mother's body reaches it. Individuals with

preconditions, such as liver, kidney, nervous system and lung disease, are at higher risk of mercury toxicity.

The second group includes those who are exposed to high levels of mercury, either through work, or products that contain mercury or are exposed to concentrations of mercury in a particular environment (work, contaminated ...). Pregnant women and women of reproductive age are considered to be at high risk due to possible fetal exposure. There are numerous studies on the toxic effects of methylmercury on the neurological, cardiovascular and immune systems of humans. For example, neurological effects are often measured through lower IQs (Spadaro and Rabl, 2008) and through various neuropsychological tests (Grandjean et al., 1998). Cardiovascular and immune effects are often associated with chronic mercury exposure (Sweet and Zelikoff, 2010; Downer et al., 2017). However, the effects of methylmercury toxicity in humans may vary, with some groups being more sensitive than others to the effects of mercury exposure. Methylmercury is known to affect the neurological development of children and has been linked to cardiovascular disease in adults (Clarkson et al., 2003; Valera et al., 2011; Grandjean et al., 2012).

The concentration of mercury in the marine ecosystem, especially in fish, is mostly studied in North America and Europe, and least in Asia, Africa and South America (Karimi et al., 2012). Globally, mercury concentrations are lowest in small, short-lived fish. There are many fish caught regularly in the Mediterranean that can be safely consumed either daily or weekly (i.e. they have average mercury concentrations below 0.22 ppm, ww), such as anchovies, sardines, flounder, cod, salmon and mullet. These species, as well as many others, are often hunted commercially and sent to European markets. Concentrations of mercury are highest in large species that live longer, many of which are pelagic. Bluefin tuna, albacore tuna, bream, bonito, leaf, hake, arrowfish and carp have average mercury concentrations above 0.22 ppm ww and are a risky choice for human consumption, where only one serving per month is recommended. Some swordfish and tuna have a body load of mercury approaching the level for which the “not for consumption” guideline applies, of 0.95 ppm ww (Table 26).

Table 26. Interpretation of mercury concentrations and associated exposure risks.

| Mercury in the marine ecosystem (ppm, ww) | Guidelines for consumption |
|--|-----------------------------------|
| ≤ 0,05 | Unlimited |
| 0,05-0,11 | 2 servings per week |
| 0,11-0,22 | 1 serving per week |
| 0,22-0,95 | 1 serving per month |
| > 0,95 | not for consumption |

The guidelines of the World Health Organization (WHO) and the European Commission (EC) for mercury concentrations in fish are 0.5 ppm, with the exception of larger predators (e.g. swordfish, sharks and some tuna) of up to 1.0 ppm, which is similar to the level of the United States Agency, which is considered “not for consumption”. As an additional reference, concentrations of mercury in fish can be compared with the guidelines for consumption and linked to the number of servings that can be consumed at different concentrations, while remaining within the health-based reference doses of methylmercury of the US Environmental Protection Agency.

Mercury concentrations in the marine ecosystem and associated meal frequency guidelines are based on US Environmental Protection Agency reference doses of 1×10^{-4} mg Hg / kg body weight / day, 60 kg body weight for an adult female and a fish serving of approximately 170 grams. These guidelines apply to fish muscle tissue, because > 95% of mercury is in methyl form. However, mercury concentrations in shellfish vary considerably in the percentage of methyl and therefore the consumption guidelines given here cannot be directly applied to data on total mercury in shellfish.

4.2 Assessment of possible effects in the gender context related to mercury management

This section presents the different roles of genders when it comes to mercury exposure and management. The aim is to ensure that gender issues are successfully included in the Implementation Action Plan. The following is a summary that illustrates patterns that are widely applicable at the human population level, concerning general exposure and gender risks in different sectors where contamination is possible.

4.2.1 Occupational exposure

Based on exposure to mercury in known occupations in Montenegro, men are usually at higher risk of exposure than women. In the absence of a domestic mercury-oriented industry, the main groups of jobs and related general patterns, identified when it comes to occupational exposure, may include:

- waste collectors, workers in medical waste incinerators and landfill workers - these groups are usually men who are at greater risk of exposure due to the handling of waste from mercury-containing devices;
- medical staff - women are often more likely to do the cleaning after medical accidents with equipment containing mercury, such as sphygmomanometers or thermometers; therefore, women would be more likely to be exposed to mercury due to the handling of medical waste;
- Environmental protection / regulation enforcement officers - this group investigates cases of environmental pollution and is usually gender balanced (but this is a less significant line of exposure);
- Firefighters and services that are the first to react in the event of a chemical accident - this group consists primarily of men.

It can be concluded that in these professions there is a tendency for men to be at greater risk than women when it comes to occupational exposure to mercury (the only important exception could be medical staff).

Based on the above, further research should focus primarily on men when it comes to occupational exposure, especially in the field of waste management and first responders, such as firefighters and those in charge of disaster risk management. However, in the medical profession, both genders are equally susceptible to mercury contamination.

4.2.2 Mercury in fish

Since similar amounts of fish are usually consumed, the issue of mercury exposure applies equally to both genders. However, adverse health effects due to mercury exposure are more significant in children, pregnant women and women of reproductive age. The reason for this conclusion is the fact that the developing organ systems (such as the nervous system of the fetus) are the most sensitive to the toxic effects of mercury. Recent studies also suggest that there may be an

increased risk of cardiovascular disease in adults (Downer et al., 2017), which is important for individuals who are either sensitive to methylmercury or have elevated levels. Men may be more prone to cardiovascular disease than women.

4.2.3 Mercury in households

In households, women and children are more likely to be exposed to mercury from broken thermometers, as women mostly use them during normal child or household care.

4.2.4 Mercury in cosmetic products

Women are more susceptible to exposure to cosmetic and personal products containing mercury, such as soaps, creams and shampoos.

Women are a more significant target group when it comes to mercury in cosmetic products. These trends are useful in organizing trainings, educations aimed at raising awareness about mercury exposure, as they enable communication strategies that are gender-sensitive and separately designed, in order to achieve maximum benefit.

Chapter V: Level of awareness / understanding of workers and the public and existing opportunities for training and education of target groups and professions

5.1. Stakeholder awareness matrix

Prior to the Initial Assessment, there were no conducted studies on the state of mercury in Montenegro. Most of the information illustrating the level of awareness about mercury was collected during the initial workshop, inventory training and mercury inventory development. In general, it was assessed that there is an average overall level of awareness about mercury, with it being high in terms of public policies and among experts, and low in civil society and the general public.

| Target group | Assessment of the level of awareness | Commentary |
|--|--------------------------------------|--|
| Ministry of Ecology, Spatial Planning and Urbanism | High | The National Focal Point for the Minamata Convention is part of this Ministry. |
| Ministry of Health | High | In cooperation with the WHO, the Ministry of Health is participating in the development of projects that will provide background information on how to solve the issue of mercury exposure in the health sector. |
| Ministry of Agriculture, Forestry and Water Management | High | As this Ministry is responsible for fisheries and water management, this sector is familiar with mercury-related issues. |
| Environmental Protection Agency | High | Monitors levels of contamination in environmental matrices. |

| | | |
|---|--------|---|
| Institute for Hydrometeorology and Seismology | Medium | Cross-border transport of mercury; mercury in aquatic ecosystems and wastewater; mercury chemicals management in a chemical laboratory; meteorological and other instruments |
| Directorate for Inspection Affairs | High | Environmental inspection is responsible for the management of chemicals in industrial plants, plants for which an integrated permit is issued and Seveso plants (Law on Chemicals 51/17). Sanitary inspection is responsible for products on the market |
| Institute for Public Health | High | It is active in the field of health, science, research and teaching, a highly specialized health care institution, familiar with issues related to mercury. |
| Center for Ecotoxicological Research (CETI) | High | Performs sampling and analysis to determine the presence of mercury in environmental matrices. |
| Water Administration | Medium | Implementation of measures and works on protection of waters from pollution |
| Local self-governments | Low | Low level of awareness, general training would be needed. |
| Health care institutions, primary and secondary health care | Medium | They are familiar with mercury-related issues, but there are still no activities that would lead to the cessation of the use of mercury-containing equipment and materials. |
| Customs officers | High | They need training for identification of mercury-containing devices, especially for border officers. |
| Educational institutions | Low | The Environmental Protection Agency conducted one training on the topic of mercury in primary and secondary schools. |
| NGO | Low | Low level of awareness, general training required. |
| Private sector | Low | Low level of awareness about the possible transition to mercury-free products. |
| Media | Low | The project will include work on raising awareness in the local media. |
| General public | Low | General information needs to be distributed. |

5.2. Opportunities for training and education

When it comes to the general public, media and NGOs, some general training would significantly increase awareness of mercury issues in Montenegro and it is expected to be organized in the future. It is also necessary to strengthen national capacities for the implementation of the Minamata Convention on Mercury and its provisions. Special attention should be paid to the needs for monitoring, research, as well as the cessation of use and replacement of mercury-containing products.

| Target group | Priority | Specific areas of training |
|--------------|----------|----------------------------|
|--------------|----------|----------------------------|

| | | |
|--|--------|---|
| Ministry of Ecology, Spatial Planning and Urbanism | High | Strengthening national capacities for the implementation of the Minamata Convention |
| Ministry of Health | High | The Ministry of Health is responsible for monitoring environmental protection measures that affect the health of citizens. It performs safety assessment and conformity assessment of a cosmetic product before placing it on the market, for the safety and protection of human life and health. |
| Ministry of Agriculture, Forestry and Water Management | High | Distribution of data on pollution of water, land, various fish species and mercury concentrations |
| Environmental Protection Agency | High | Strengthening national capacities for future implementation of the Minamata Convention; monitoring and research |
| Directorate for Inspection Affairs | High | Control over the implementation of regulations |
| Institute for Public Health | High | Monitoring and research |
| Institute for Hydrometeorology and Seismology | Medium | Monitoring and research |
| Center for Ecotoxicological Research (CETI) | Medium | Monitoring and research |
| Educational institutions | Medium | For primary and secondary education - general awareness, the project supported these activities |
| NGO | Low | General awareness |
| Customs officers | High | Identification of mercury-containing products and handling and monitoring procedures |
| Media | Medium | General awareness |
| General public | High | General awareness |

6. Key findings of the situation analysis and identification of priority problems and challenges

| Mercury pollution | | |
|--|--|---|
| Poor management of mercury-containing waste | Application of outdated technologies | There is no systematic monitoring of mercury-containing products and waste |
| Infrastructure for disposal of mercury-containing products, stainless steel containers, specially designed containers do not exist | The application of best available technologies (BAT) in the industry is missing | There is no functional register of pollutants |
| The existing normative framework does not regulate the issue of treatment of waste containing mercury in a quality manner | Safer alternatives for batteries, electrical and electronic equipment, thermometers are not used | Operators do not provide data on discharges, emissions, transmission and disposal of mercury and waste containing mercury into the environment |
| The principle of extended producer responsibility is not being applied | Operators are not educated about BAT and safer alternatives | Operators of industrial plants are not educated on how to release mercury into the environment, on the application of best available techniques or best environmental practices (BAT / BEP) for “control and reduction, where feasible,” of mercury emissions, as well as on mercury discharges into land and water from individual sources |
| Low level of public awareness regarding the treatment of mercury-containing waste | Use of dental amalgams in the health system | There are no guidelines for manufacturers, importers and exporters on defined restrictions, bans on the use of mercury-containing products, and measures to be taken to reduce the production, import or export of new mercury-containing products, safer alternatives |
| The normative framework in the field of chemicals, in line with changes at EU level, needs to be further harmonized | Use of measuring devices containing mercury in the health system | Customs officers cannot identify mercury-containing products |

Mercury-containing waste management

Regulations related to safe mercury management are largely harmonized with EU requirements and relevant international conventions, while further harmonization is planned in the waste sector by adopting the Law on Waste Management and secondary legislation based on it.

Legal entities and entrepreneurs that produce, import, distribute and use and place on the market mercury and products containing it, are obliged to **properly classify, label and package them**. The manner and criteria for classification, labeling and packaging of chemicals are prescribed in accordance with the Globally Harmonized System (GHS) and include **hazard assessment** that requires certain **expertise and training**.

Mercury and the product that contains it must be accompanied by a **safety data sheet**, which especially contains the identification of the chemical, information on the method of use, chemical properties, protection measures, as well as data on the supplier of the chemical, etc. This document is intended for professional users and other stakeholders and it provides key information on the chemical. Therefore, the quality of the safety data sheet is **essential for communication on hazards and protection measures related to mercury**.

Prohibitions and restrictions on chemicals identified by a detailed risk assessment in a centralized procedure in the EU as posing an unacceptable risk to human health and the environment for certain uses or when found in certain products (Annex XVII REACH) have been transposed into national law by a secondary legislation on the prohibition and restriction of the use, placing on the market and production of chemicals that pose an unacceptable risk to human health and the environment. These **prohibitions and restrictions apply to mercury and mercury compounds individually, in mixtures and / or in products** of various purposes and types, including thermometers, other measuring devices intended for free sale (manometers, sphygmomanometers - pressure devices, barometers, thermometers, etc.) and are a reflection of regulations on chemicals in other areas that require good interdepartmental communication. In this regard, it is necessary to prepare information material in order to educate importers about the prescribed prohibitions and restrictions.

The Prior Informed Consent (**PIC**) procedure is carried out for the **export** of mercury which is on the List of Chemicals for the PIC Procedure, i.e., for chemicals from the Rotterdam Convention List and these chemicals can be exported only if the importing country agrees to export. **Import** of chemicals from this List into Montenegro can be done if the consent is issued on the basis of prior information to the competent authority of the exporting country. The EPA conducts administrative procedures related to the PIC procedure, and the Revenue and Customs Administration controls the implementation of these provisions. Implementation of the PIC procedure should be continued in the further work according to the established concept, with the continuation of cooperation between the EPA and the Revenue and Customs Administration.

The priority challenge in this segment of the analysis is to further improve the legislative framework through the transposition of EU Regulation No. 2017/852 on mercury into national legislation. Specifically, the Law on Waste Management and secondary legislation which is to be adopted on the basis of law need to transpose Chapter V of the said Regulation (mercury-containing waste, storage of this type of waste, treatment of contaminated sites).

Due to the fact that there is no adequate selective separation and collection of mercury-containing waste, both municipal and medical waste, it is necessary, in addition to adequate legislation, to

raise awareness of all participants in the waste management chain, as well as to provide the necessary infrastructure, in order to adequately dispose of mercury-containing waste. It is also necessary to provide training in order to apply the principle of extended producer responsibility in accordance with the new legal solutions.

Taking into account the relatively frequent changes in EU regulations in the field of chemicals management, which, among other things, recognize mercury, in order to adapt to technical progress and / or comply with requirements of international agreements, part of activities under this National Plan should relate to amendments to existing regulations in the field of chemicals.

Outdated technologies

Mercury is used in industrial processes (e.g. chlor-alkali process, plastics industry, etc.) and in products (dental amalgams). It is also released during the burning of fossil fuels, especially in coal-fired thermal power plants.

In that sense, the existing installations for which there is a need for significant investment in the technological process have been identified. Montenegro has Pljevlja TPP plant that uses coal, the combustion of which leads to emissions of mercury into the air, while on the other hand, Uniprom KAP releases mercury into water and land. In that sense, it is necessary for every operator to define measures and time schedule of planned measures and annual costs necessary for taking measures, as well as a description of expected results and ways of control of planned measures. The application of the principle of best available techniques is a key factor determining the costs of the industrial sector. The BREFs (Best Available Techniques Reference Documents) provide guidelines in this area, while the assessment of local circumstances and conditions will also have a major impact.

The implementation of the TEP-I ecological restoration project will contribute to the prevention or reduction of mercury emissions into the air from the combustion of coal and / or lignite, by applying BAT which defines the use of one of the techniques listed for solid particles or their combinations:

- SCR technique in combination with other techniques for improvement or reduction of Hg oxidation before separation in ESP or DeSOx plant,
- Special techniques such as injection of carbon-based sorbents into flue gases, use of halogen additives in fuel or their injection into the boiler, etc.

Taking into account the above, it is necessary to hold consultations on this topic with operators, in order to be informed about the requirements prescribed by the Law on Industrial Emissions, as well as to be informed about the conclusions on the best available techniques. It is important to point out that by investing in new technologies, they invest directly in the product, and thus have benefits in terms of competitiveness in the market.

Bearing in mind that one part of mercury management relates to mercury management in the health system (measuring devices, dental amalgam...) we point out that public dental institutions still use mercury dental amalgam. Specific mercury waste management practices have not yet been promoted and established, and it would be important to determine the amount of dental amalgam imported annually to gain an idea of the extent to which alternative fillings are used in relation to amalgam fillings. In addition, early action could be promoted to phase out dental

amalgams, with amalgam waste management practices being improved to minimize releases to the environment. The same principle should be applied to mercury-containing measuring devices used in the health sector.

The Revenue and Customs Administration is the body responsible for controlling the export and import of mercury and is very useful in providing data on the number of mercury-containing products on the market. The Revenue and Customs Administration of Montenegro also fully implements the provisions of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. The biggest challenge is to define and obtain the data and information needed to identify mercury-containing products, as the harmonized tariff code system (HS) for different mercury-containing products alone was not sufficient to make a final assessment of the number of mercury-containing products, so, in this regard, it is planned to publish guidelines at the EU level that would facilitate the control of these products.

The priority challenge in this segment of the analysis is the readiness of all operators to meet all legal requirements in terms of technology and finance. The situation is further aggravated by objective circumstances with the operators, such as changes in the ownership structure, the introduction of bankruptcy proceedings, etc., which further reduces the capacity to plan new investments, modernize technology and remedy existing problems. In order to ensure the application of BAT, it is necessary to hold trainings on this topic with operators, in order to be informed about the requirements prescribed by the Law on Industrial Emissions, as well as to be informed about the conclusions on the best available techniques.

The product that should be phased out is dental amalgam and countries should apply two measures from a list of nine options, taking into account national circumstances. Possible activities are the selection of two measures from the list that includes, e.g. establishing prevention programs to minimize the need for dental fillings and promoting the use of cost-effective and clinically effective mercury-free alternatives, as well as insurance programs that encourage mercury-free alternatives compared to mercury amalgam and limiting the use of encapsulated amalgam.

It is also necessary to use the available donor funds in order to identify and gradually exclude from the use measuring devices that contain mercury, and are used in the health sector.

Since the Revenue and Customs Administration does not have data on whether some of the products contain mercury, it is necessary to develop instructions and conduct training for both manufacturers (if any) and importers and exporters, in order to determine based on technical specifications of equipment and products, whether the imported or exported product really contains mercury and in what quantity.

Establishment of systematic monitoring of mercury-containing products and waste

Montenegro ratified the PRTR Protocol in July 2017 (“Official Gazette of Montenegro-International Agreements”, No. 6/17). The Register of Pollutants in accordance with Regulation (EC) 166/2006 (E-PRTR) for which the Law on the Environment (“Official Gazette of Montenegro”, No. 52/16) determines the legal basis, **has not yet been established**. The Rulebook on the detailed content and manner of keeping the cadaster of environmental pollutants (“Official Gazette of Montenegro”, No. 45/17) specifies the conditions for the application of this provision of the Law on Environment.

Pursuant to the Law on Environment, the register of environmental pollutants should contain data on: sources, type, quantity, manner and place of discharge, transfer and disposal of pollutants and waste into the environment, while polluters are obliged to submit data to the Environmental Protection Agency every year for the previous one. Therefore, in the future it is necessary to intensify activities in order to establish and precisely define the register of pollutants, i.e., it is necessary to procure installations of IT tools in order to establish a **functional cadaster of pollutants** that would allow exchange of information between relevant authorities.

It is also desirable to consolidate and publish statistically processed data from the Cadaster of Pollutants through the Environmental Information System in order to make relevant information from the register available to the public. Establishing the operability of this system is of great importance for the entire field of environment, so further work should be done on its development.

The level of public awareness of the risks of using mercury-containing products and the need for adequate management is still not satisfactory. Although the competent authorities and authorized institutions (IPH), within their duties and possibilities, conduct information and education of certain target groups, in order to achieve a satisfactory level of awareness of the general population, other stakeholders should be involved in activities for raising awareness of risks, with an emphasis on establishment of partnerships between competent authorities and NGOs and consumer associations to disseminate information and raise awareness in this area.

The priority challenge in this segment of the analysis is the establishment of a pollutant register with a database on pollutant emissions, established within the EPA. In this sense, it is necessary to develop adequate IT tools (software and hardware), which should enable: adequate storage and statistical processing of available data, online submission of application for registration and support for establishing a secure connection with EU databases. In order for the register to function properly and systematization of data, it is necessary, among other things, to identify pollutants, conduct training on the use of the software and apply the methodology for preparing the cadaster of pollutants, create an application form in accordance with the Rulebook on detailed content and disaster management of environmental pollutants, so as to enable online registration in the cadaster. It is also necessary to conduct training for operators of industrial plants. Raising the awareness of employees in the competent state and other relevant institutions. In order to involve the civil sector, on the topic of raising awareness of the general population about the risks and protection measures when using mercury-containing products, cooperation with the competent authorities on the implementation of joint projects should be encouraged.

VI Strategic and operational goals with accompanying indicators of success and activities

The general strategic goal to be achieved is:

Protection of the environment and human health from the negative effects of mercury

This goal will be achieved through the achievement of the following operational goals with the accompanying indicators of success shown in Table 27.

Table 27 - Operational goals of the National Implementation Plan with accompanying indicators of success

| Operational goal | Performance indicator |
|---|---|
| <p>GOAL 1. Improve the management of mercury-containing waste</p> | <p><u><i>% of mercury-containing waste exported in accordance with the Law on Waste Management</i></u></p> <p><i>Initial value: there is no data on exported quantities of mercury-containing waste</i></p> <p><i>Transition value: 10% of exported waste by the end of 2022</i></p> <p><i>Target value: 20% of exported waste by the end of 2023</i></p> |
| <p>GOAL 2: Introduce technologies and safer alternatives that significantly reduce mercury emissions and use</p> | <p><u><i>The number of plants in which new BAT-compliant technology has been introduced to reduce emissions and discharges of mercury</i></u></p> <p><i>Initial value: There are no plants that use BAT to reduce emissions and discharges of mercury</i></p> <p><i>Transition value: 1 plant that adjusts to BAT in order to reduce emissions and discharges of mercury</i></p> <p><i>Target value: 2 plants that adjust to BAT in order to reduce emissions and discharges of mercury</i></p> <hr/> <p><u><i>The number of health care institutions in Montenegro that use measuring devices with mercury</i></u></p> <p><i>Initial value: in 40 examined health care institutions there are 936 thermometers of different types¹⁹</i></p> <p><i>Transition value: the number of health care institutions that use measuring devices with mercury is 30</i></p> <p><i>Target value: the number of health care institutions that use measuring devices with mercury is 20</i></p> <hr/> <p><u><i>The number of dental clinics in Montenegro that use dental amalgams:</i></u></p> <p><i>Initial value: there is no data on the number of dental clinics that use dental amalgams</i></p> <p><i>Transition value: the number of clinics using dental amalgams reduced by 5% compared to those identified</i></p> |

¹⁹ MEDICAL DEVICES SUMMARY REPORT MONTENEGRO GLOBAL GEF PROJECT ON PHASING DOWN MERCURY-CONTAINING MEDICAL DEVICES: MEDICAL DEVICES AND STAKEHOLDER ENGAGEMENT IN MONTENEGRO MSc. dr Zorica Đorđević, MSc Gordana Đukanović, dr Borko Bajić, 2021

| | |
|--|---|
| | Target value: the number of clinics that use dental amalgams reduced by 10% compared to those identified |
| GOAL 3: Establish effective monitoring of mercury-containing products and waste | <u>Records of mercury emissions into the environment</u> <i>Initial value:</i> there are no records of mercury emissions into the environment; <i>Transition value:</i> Established and precisely defined Pollutant Register (PRTR) with a database on mercury emissions and discharges <i>Target value:</i> Established records of mercury emissions into the environment, deadline: 2023 |
| | <u>% of mercury-containing products in use</u> <i>Initial value:</i> there is no data on the quantities of mercury-containing products in use <i>Transition value:</i> 5% of mercury-containing products replaced by alternative products <i>Target value:</i> 10% of mercury-containing products replaced by alternative products |

A detailed description of activities to achieve operational goals, as well as deadlines, activity holders, implementation indicators and financial assessment / sources of funding, are given in the Action Plan²⁰ in Chapter VIII of the National Implementation Plan of the Minamata Convention.

VII Monitoring the implementation of the National Plan, reporting and evaluation

7.1. Implementation monitoring and reporting

In order to monitor the achievement of the goals set by the National Plan, it is necessary to regularly: implement specific activities, meet deadlines and goals. Reports on the implementation monitoring will be done at the end of every second calendar year within the period covered by the National Plan. The report will summarize the achieved results and give suggestions for possible improvements in the implementation during the implementation of the National Plan.

In this regard, as a measure to ensure adequate monitoring and coordination of all activity holders involved in the implementation of the Action Plan, it is recommended that a Working Group be formed to be responsible for implementation monitoring. The monitoring working group should consist of representatives of the competent authorities identified as bearers of individual activities from the Action Plan, with a special focus on the following responsibilities in terms of providing data: The monitoring working group should consist of representatives of the competent authorities identified as holders of individual activities from the Action Plan, with a special focus on the following responsibilities in terms of data provision:

²⁰ The field of mercury management is very specific both in terms of demanding norms and in the sense that it is a relatively new Convention that is just beginning to be applied at the global level. Bearing in mind all the above, certain measures cannot be implemented in a short period of time, so it was decided to make the first Action Plan for a four-year period.

- MESPU - data on regulations related to chemicals and biocidal products, project activities in the field of chemicals and waste management, including the implementation of conventions, etc.;
- EPA - data on administrative procedures related to chemicals and biocidal products, on the Help Desk activities, on the Register of Chemicals / Biocidal Products;
- DIA - data on inspection supervision conducted by ecological and sanitary inspection;
- AFSVPA - data on regulations and administrative procedures related to products for plant protection and nutrition, data on activities related to sustainable use of pesticides, as well as on inspections carried out by phytosanitary and veterinary inspections;
- MoH - data related to dental amalgam and cosmetic products;
- Institute for Medicines and Medical Devices - records of import of dental amalgams (responsible for import of medical devices);
- IHS- data on transboundary transport of mercury through the atmosphere; data on mercury content in aquatic ecosystems; available data on the presence of mercury in wastewater;
- IPH and CETI - data on activities related to laboratory testing of chemicals and products containing them;
- UCG - data on participation in trainings and examinations.

Monitoring activities of the implementation of the National Plan will be coordinated by the MESPU. Every holder of activities from the Action Plan is obliged to submit data related to the implementation of activities determined by the Action Plan to MESPU after the end of the second calendar year, and more often if necessary. MESPU is in charge of coordinating the collection and consolidation of data and writing the Report on the implementation of the Plan, based on data available to it as the primary competent authority for chemicals management, as well as data provided by other activity holders from the Action Plan in accordance with their responsibilities. The report is submitted to the Government through the General Secretariat of the Government²¹ by March 31 of every second calendar year and it is published on the MESPU website.

7.2. Evaluation and final reporting

At the end of the 2022-2023 period to which the Action Plan refers, it is necessary to evaluate the implementation, i.e., analysis of the effects of all implemented activities and the degree of fulfillment of goals in order to draw conclusions and recommendations for the next period.

The basic principle of the evaluation process will be to ensure independence and objectivity in the analysis of relevance, efficiency, effectiveness and sustainability of activities and programs in the field of mercury management, in order to provide clear guidelines for further improvement of mercury management systems.

²¹ Before submitting the report to the Government, it is necessary for the General Secretariat of the Government to give an opinion on the Report, i.e., check its structure and content in terms of compliance with the requirements of the Methodology accompanying the Regulation on the manner and procedure of drafting, harmonizing and monitoring strategic documents.

Chapter VIII: Implementation Action Plan and Priorities for Action

In order to achieve the goals set by the National Implementation Plan of the Minamata Convention on Mercury, with the Action Plan for the period 2022-2023 and the Minamata Initial Assessment Report, it is necessary to implement the activities set out in the Action Plan in Table 28.

Financing of activities envisaged by the Action Plan is partly provided from the budget (in the total amount of € 48,000) for activities related to raising public awareness, while financing of part of activities related to improving the implementation of regulations is provided from donor funds, IPA and others (in the amount of € 244,500). Funds in the total amount of € 271,900 without VAT are provided from the World Bank loan, and they relate to the establishment of a waste register.

Table 28 - Action plan for the implementation of the Minamata Convention

| | | | | | | |
|---|--|--|--|--------------------------------|---|----------------------------|
| Strategic goal | Protection of the environment and human health from the negative effects of mercury | | | | | |
| Operational goal 1: | Improve the management of mercury-containing waste | | | | | |
| Performance indicator: % of mercury-containing waste exported in accordance with the Law on Waste Management | Initial value: there is no data on exported quantities of mercury-containing waste | Transition value: 10% of exported waste containing mercury by the end of 2022 | Target value: 20% of exported waste containing mercury by the end of 2023 | | | |
| Activity | Result indicator | Competent institutions | Commence ment date | Planned completion date | Funds planned for the implementation of the activity | Source of financing |
| 1.1. Adopt the Law on Waste Management in order to transpose the provisions related to the management of waste containing mercury | The law has been adopted The law was published in the Official Gazette | MESPU | 2022 | IV 2023 | € 0.00 | MESPU budget |

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| 1.2. Procurement of containers for disposal of mercury-containing waste | 2 containers have been purchased | MESPU | 2022 | IV 2023 | € 3.000 | Funds will be provided by donors |
| 1.3. Creating information material in order to get information about the principles of extended producers responsibility and adequate treatment of mercury-containing waste | 2 flyers have been created | MESPU | 2022 | IV 2023 | € 5.000 | MESPU budget |
| 1.4. Update the regulation on prohibited or permitted uses, production and placing on the market of chemicals that pose an unacceptable risk to human health and the environment | Regulation has been adopted Regulations has been published in the Official Gazette | MESPU | 2023 | IV 2023 | € 0.00 | MESPU budget |
| 1.5. Update lists of hazardous chemicals and products whose export is prohibited | Rulebook has been adopted Rulebook has been published in the Official Gazette | MESPU | 2022 | IV 2022 | € 0.00 | MESPU budget |
| 1.6. Identification of waste with mercury content exported in 2022 | Amount of waste has been identified | MESPU | I 2022 | II 2023 | € 0.00 | MESPU budget |
| Operational goal 2: | Introduce technologies and safer alternatives that significantly reduce mercury emissions and use | | | | | |
| Performance indicator: The number of plants in which new BAT-compliant | Initial value: There are no plants that use BAT to reduce | Transition value: 1 plant that adjusts to BAT in order to reduce emissions | | Target value: 2 plants that adjust to BAT in order to reduce | | |

| technology has been introduced to reduce emissions and discharges of mercury | | emissions and discharges of mercury | | and discharges of mercury | | emissions and discharges of mercury | |
|---|--|-------------------------------------|-------------------|---------------------------|---|---|--|
| Activity | Result indicator | Competent institutions | Commencement date | Planned completion date | Funds planned for the implementation of the activity | Source of financing | |
| 2.1. Application of BAT / BREF in plants | Information containing data on the reduction of environmental pollution through data on emissions / immissions | Operators | 2022 | 2023 | Operators of plants subject to the obligation to have an integrated permit are obliged to invest significant financial resources in order to reduce pollution | Estimated investments of Pljevlja TPP amount to € 61,375.00 related to technical and ecological reconstruction of the plant; “TOSCELIK Alloyed Engineering Steel d.o.o.” €4.700.000; Podgorica aluminum plant in bankruptcy about € 40 million. | |
| 2.2. Conduct educational campaigns on the introduction of best available techniques | One educational campaign has been conducted | MESPU, EPA | 2022 | 2022 | € 20.000 | Funds were provided from the MESPU through the project: | |

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|--|---|---|---|--------------------------------|---|---|
| | | | | | | Training program to meet the final benchmarks for Chapter 27 - Environment and Climate Change for the period 2021-2025 |
| Performance indicator: The number of health care institutions that use measuring devices with mercury | Initial value: in 40 examined health care institutions there are 936 thermometers of different types | Transition value: the number of health care institutions that use measuring devices with mercury is 30 | Target value: the number of health care institutions that use measuring devices with mercury is 20 | | | |
| Activity | Result indicator | Competent institutions | Commencement date | Planned completion date | Funds planned for the implementation of the activity | Source of financing |
| 2.3. Promoting the use of safer measuring devices | Workshops / round tables have been conducted | MoH, MESPU | 2022 | 2022 | | Funds provided by the World Health Organization from the budget of the project: Phasing out of mercury-containing products in the health sector |

| 2.4. Conducting educational campaigns on the management of mercury-containing medical waste in an environmentally friendly way from storage to disposal | One educational campaign has been conducted | DIA / RCA | 2022 | 2023 | | Funds provided by the World Health Organization from the budget of the project: Phasing out of mercury-containing products in the health sector |
|---|---|---|-------------------|---|--|--|
| Performance indicator: The number of dental clinics that use dental amalgams: | | Initial value: there is no data on the number of dental clinics that use dental amalgams | | Transition value: the number of clinics using dental amalgams reduced by 5% compared to those identified | | Target value: the number of clinics that use dental amalgams reduced by 10% compared to those identified |
| Activity | Result indicator | Competent institutions | Commencement date | Planned completion date | Funds planned for the implementation of the activity | Source of financing |
| 2.5. Conducting educational campaigns on the introduction of safer alternatives to dental amalgams, as well as special practices for management of mercury-containing waste | One educational campaign has been carried out | MESPU, MoH | 2022 | 2022 | € 5.000 | Funds provided by the UNEP special program through the project: Strengthening synergies |

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|--|---|--|------|---|--------|--|
| | | | | | | between the Basel, Rotterdam, Stockholm and Minamata conventions |
| 2.6. Monitoring the import of dental amalgam | Report on the amount of imported dental amalgam in the previous year submitted to the MoH and MEPPU by the end of March this year | The Institute for Medicines and Medical Devices | 2022 | 2023 | € 0.00 | Regular activity |
| 2.7. Identification of dental clinics that use dental amalgams | Number of identified clinics | Directorate for Inspection Affairs - Department for Health and Sanitary Inspection, that is competent in accordance with the law | 2022 | 2023 | € 0.00 | Regular activity |
| Operational goal 3 | Establish effective monitoring of mercury-containing products and waste | | | | | |
| Performance indicator: Records of mercury emissions and discharges into the environment | Initial value: there are no records of mercury emissions | Transition value: Established and precisely defined Pollutant Register | | Target value: Established records of mercury emissions | | |

| | | and discharges into the environment; | with a database on mercury emissions and discharges | and discharges into the environment | | |
|--|----------------------------------|--------------------------------------|---|-------------------------------------|--|---|
| Activity | Result indicator | Competent institutions | Commencement date | Planned completion date | Funds planned for the implementation of the activity | Source of financing |
| 3.1. Assessment of legal, institutional, technical and capacity building needs, and for drafting proposals for the establishment of PRTR in Montenegro | Situation analysis has been made | MESPU / EPA | November 1, 2021 | January 31, 2022 | € 5.000 | Funds were provided by donors from the Federal Ministry of Environment, Nature Conservation and Nuclear Safety of Germany through the project: Enhancement of Pollutant Release and Transfer Registers (PRTRs) in the Western Balkans and the Republic of Moldova |

| | | | | | | |
|---|---|--------------------|-------------|-------------|------------------|--|
| <p>3.2. Develop adequate IT tools (software and hardware), which should enable: adequate storage and statistical processing of available data, online submission of applications for registration, support for establishing a secure connection with EU databases</p> | <p>Pollutant Register (PRTR) with a database has been established</p> | <p>EPA</p> | <p>2022</p> | <p>2022</p> | <p>€ 234,500</p> | <p>IPA III - Technical Support Project has been proposed, which, among other things, includes activities on the establishment of the Pollutant Registry (PRTR) in the amount of € 234,500</p> <p>In case of the need for providing additional funds, the source of funding will be identified in a timely manner</p> |
| <p>3.3. Conduct training on the use of the software and apply the methodology for preparing the cadaster of pollutants</p> | <p>Number of conducted trainings for operators and competent institutions</p> | <p>MESPU / EPA</p> | <p>2022</p> | <p>2022</p> | | <p>IPA III</p> |

| | | | | | | |
|--|--|---|--|--------------------------------|---|---|
| 3.4. Establish a system for centralized data collection for all types and quantities of waste | The system has been established | EPA | September 2019 | January 31, 2022 | € 271,900 without VAT | Funds provided through a loan from the Government of Montenegro with the World Bank, Industrial Waste Management and Cleaning project |
| Performance indicator: % of mercury-containing products in use | Initial value: there is no data on the quantities of mercury-containing products in use | Transition value: 5% of mercury-containing products replaced by alternative products | Target value: 10% of mercury-containing products replaced by alternative products | | | |
| Activity | Result indicator | Competent institutions | Commencement date | Planned completion date | Funds planned for the implementation of the activity | Source of financing |
| 3.5. Development of information material in order to provide information about the restrictions and prohibitions on the use and placing on the market of products containing mercury | Flyers have been made for operators / distributors and customs officers | MESPU, EPA | 2022 | 2023 | | Funds provided by the UNEP special program through the project: Strengthening synergies between the Basel, |

| | | | | | | |
|---|--|------------------------|------|------|----------|---|
| | | | | | | Rotterdam, Stockholm and Minamata conventions |
| 3.6. Monitoring the import of products that may contain mercury | The report on the quantity of imported products in the previous year was submitted to MESPU by the end of March of the current year | RCA | 2022 | 2023 | € 0.00 | Activity covered from the budget |
| 3.7. Organize educational events to raise awareness in order to educate the general public about the dangers of exposure to mercury and mercury compounds | Brochures, leaflets, etc. have been made and distributed Three lectures were held in three primary schools At least one media appearance | NGO EPA / IPH / UCG | 2022 | 2023 | € 20.000 | Activity covered from the budget of EPA / IPH / UCG / NGO |

Table with an overview of the detailed legislative and institutional framework, in line with the requirements of the Minamata Convention

| Article 3 of the Minamata Conventions - Sources of supply and trade in mercury | |
|--|--|
| Article description: | |
| <ul style="list-style-type: none"> • It addresses the issue of sources of supply and trade in mercury. • The provisions of this Article do not apply to mercury compounds used for laboratory research, mercury and mercury compounds naturally occurring in traces and mercury-containing products. • It prohibits Contracting Parties from permitting the exploitation of mercury which was not carried out before the country's accession to the Convention, and only permits the exploitation of mercury that began before signing and that may last for a maximum of 15 years from the date of signing. • It encourages countries to identify individual stocks of mercury and mercury compounds exceeding 50 metric tonnes and, if they find that mercury, to dispose of it in accordance with the Guidelines for Environmentally Sound Management. • Countries are not allowed to export mercury, except for the purpose of its environmentally friendly storage or if it is necessary to ensure the protection of human health (the same applies to imports). | |
| Summary of relevant provisions: | |
| <ul style="list-style-type: none"> • Do not allow new primary exploitation of mercury. • Phase out existing primary mercury exploitation within 15 years. • Prevent the import and use of mercury from the primary exploitation of mercury for artisanal mining and small-scale gold production. • In accordance with Article 3, paragraph 5, item b, restrict the import and use of excess mercury resulting from the decommissioning of chlor-alkali plants, and require environmentally sound disposal. • Obtain information on stocks of mercury or mercury compounds exceeding 50 metric tons (MT) and on deliveries of mercury producing stocks greater than 10 MT / year. ✓ <u>Do not allow the export of mercury unless the importing country provides written consent stating that the mercury will be used for permitted purposes or stored in an environmentally sound manner, and that all other conditions of Article 3 paragraph 6 are met.</u> ✓ <u>Do not allow the import of mercury without consent, ensuring that both the source of mercury and the proposed use are permitted by the Convention (and applicable domestic legislation).</u> | |
| Adopted policy measures and regulations that enable Montenegro to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| Law on Environment (“Official Gazette of Montenegro”, No. 52/16) | Article 49, paragraph 1: the export of metallic mercury, cinnabarite, mercury (I) chloride, mercury (II) oxide and mixtures of metallic mercury with other substances, including mercury alloys, with a mercury concentration of at least 95% by weight is prohibited. |

| | |
|---|---|
| | Article 49, paragraph 2: the prohibition referred to in paragraph 1 of this Article does not apply to exports for scientific research, medical or analytical purposes. |
| | Article 49, paragraph 5: waste referred to in paragraph 4 of this Article is disposed of in a manner that is safe for human health and the environment and in accordance with the law governing waste management. |
| Rulebook on the detailed content of the procedure for granting consent on the basis of prior notification for the export of chemicals ("Official Gazette of Montenegro", No. 61/17) | Annex III to the Rulebook on the list of chemicals subject to the prior notification procedure in accordance with the Rotterdam Convention The importing country, in cases of permitted exports of mercury, is required to provide a written guarantee that the exported mercury will be used for the purpose permitted or stored in an environmentally sound manner. |
| Unresolved aspects of regulations or policies that need to be addressed / developed to ensure compliance with the provisions of the Convention (only in relation to binding provisions): | |
| <ul style="list-style-type: none"> • Ensure adequate inspection control. | |
| Relevant national stakeholders: | |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> • The main institution for transposing the relevant articles related to Article 3 is the MESPU, and the above articles have been transposed into legislation through the Law on Environment and the Rulebook on the detailed content of prior notification procedure for the export of chemicals |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> • In the part of MESPU administrative capacities for regulating the issue of chemicals management, there is one employee. |
| EPA | EPA conducts administrative procedures related to the PIC procedure The prior notification procedure (PIC procedure) is carried out for the export of a chemical on the PIC Procedure List, i.e., for chemicals from the Rotterdam Convention List, and these chemicals can be exported only if the importing country agrees to export. Import of chemicals from this List into Montenegro can be done if the consent is issued on the basis of prior notification to the competent authority of the exporting country. |
| DIA | Role with regard to the above provisions: <ul style="list-style-type: none"> • The Directorate for Inspection Affairs is responsible for inspecting the implementation of legislation in the area of environmental protection, including the sub-area of chemicals. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> • The Directorate has 7 environmental inspectors who are responsible for all environmental issues in all sub-areas, including issues related to chemicals. According to the Law on Chemicals, which was adopted in 2017, the competence over the management of chemicals is divided between the ecological and sanitary inspection. <u>It is necessary to increase the number of trainings / educations for supervision over the implementation of legislation related to chemicals and / or hazardous waste management.</u> |
| RCA | Role with regard to the above provisions: <ul style="list-style-type: none"> • The Revenue and Customs Administration is the authority responsible for controlling the export and import of mercury. It is necessary to increase the number of trainings / educations for supervision over the implementation of legislation related to the import / export of mercury. |
| Other shortcomings in capacities at the national level that need to be addressed: | |

- Improving the work of the national help desk with the aim of providing information and advice (to manufacturers, importers and distributors) on responsibilities and obligations (in accordance with domestic legislation, harmonized with EU regulations).
- Designation of the body responsible for receiving information on emergency medical response - Poison Control Center.
- Administrative capacity of DIA and EPA should be trained for the needs of efficient implementation in the field of chemicals, specifically in the field of safe mercury management.

Article 4 - Mercury-containing products

Article description:

- It deals with the issue of mercury-containing products.
- Every country should take appropriate measures to ban the production, import or export of mercury-containing products.

Summary of relevant provisions:

- ✓ **Do not allow the production or import of products listed in Part I of Annex A which are not otherwise excluded after the phase-out date listed in Annex A.**
- ✓ Phase out the use of dental amalgam through two or more measures listed in Part II of Annex A.
- ✓ **Take measures to prevent the installation of products listed in Part I of Annex A (i.e., switches and relays, batteries) into larger products that are being assembled.**
- ✓ **Turn away from the production and distribution of new types of mercury-containing products.**

Adopted policy measures and regulations that enable the country to comply with the above provisions

| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
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| Law on Environment ("Official Gazette of Montenegro", No. 52/16) | Article 49, paragraph 3: It is prohibited to mix metallic mercury with other substances with the sole purpose of exporting metallic mercury. |
| Law on Cosmetic Products ("Official Gazette of Montenegro", No. 24/19) | Article 24 It is prohibited to place on the market cosmetic products that are not safe, or that contain substances: <ol style="list-style-type: none"> 1) which are prohibited; 2) in quantities that are greater than allowed, use of which is limited; 3) which are exclusively or predominantly intended for coloring a cosmetic product, the whole body or certain body parts by absorbing or reflecting visible light (colors), including substances related to oxidative hair dyes; 4) which are exclusively or predominantly intended to prevent the development of microorganisms in a cosmetic product (preservatives); 5) which are exclusively or predominantly intended to protect the skin from certain UV radiation through the absorption, reflection or scattering of UV radiation (UV filters); and 6) use of which may be harmful to human health |
| Regulation on prohibited or permitted uses, production and placing on the market of chemicals that pose an unacceptable risk to human | Annex I - 18 and 18a on mercury-containing products |

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| health and the environment (“Official Gazette of Montenegro”, No. 71/18) | |
| Regulation on the manner and procedure for the establishment of the system of taking, collecting and treatment of waste deriving from electrical and electronic products and on the system functions (“Official Gazette of Montenegro” No. 24/12) | Annex II of the Regulation: Pre-treatment of waste equipment in a treatment plant |
| Rulebook on threshold values for the presence of hazardous substances in electrical and electronic products (“Official Gazette of Montenegro”, No. 67/18). | This Rulebook prescribes the limit values for the presence of hazardous substances in electrical and electronic products, the designation of type of waste and the method of management of waste generated from these products. |
| Unresolved aspects of regulations or policies that need to be addressed / developed | |
| <ul style="list-style-type: none"> • Introduce additional exemptions into legislation, as set out in Part I of Annex A. • Establish measures to phase out the use of dental amalgam, as proposed in Part II of Annex A. | |
| Relevant national stakeholders: | |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> • The main institution for transposing the relevant articles related to Article 4 is the MESPU, and the above articles have been transposed into legislation through the Law on the Environment, the Law on Chemicals and the Law on Waste Management. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> • MESPU administrative capacities for regulating chemicals and waste management are insufficient. |
| DIA | Role with regard to the above provisions: <ul style="list-style-type: none"> • The Directorate for Inspection Affairs is responsible for inspecting the implementation of environmental legislation, including the sub-area of chemicals and the management of mercury-containing waste, as well as the supervision of cosmetic products. They are also responsible for inspecting the Law on Medical Devices. Environmental inspection is responsible for the management of chemicals in industrial plants, plants for which an integrated permit is issued and Seveso plants, while the sanitary inspection is responsible for products on the market, cosmetics and medical devices. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> • The Directorate has 7 environmental inspectors who are responsible for all environmental issues in all sub-areas, including issues related to chemicals. |
| MoH | Role with regard to the above provisions: <ul style="list-style-type: none"> • The Ministry of Health is responsible for assessing the safety and conformity assessment of a cosmetic product, before placing it on the market. |
| | Existence of adequate institutional capacity to comply with the above provisions: |
| Institute for Medicines and Medical Devices | Role with regard to the above provisions: <ul style="list-style-type: none"> • The Institute for Medicines and Medical Devices is responsible for production, trade and testing of medicines and medical devices, measures to ensure the quality, safety and effectiveness of medicines and medical devices (dental amalgams) |

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| RCA | Role with regard to the above provisions: <ul style="list-style-type: none"> The Revenue and Customs Administration is the body responsible for controlling the export and import of products that contain or may contain mercury. | |
| | Existence of adequate institutional capacity to comply with the above provisions: It is necessary to define the best way for the customs authority to control mercury-containing products. | |
| Other shortcomings in capacities at the national level that need to be addressed: | | |
| <ul style="list-style-type: none"> The administrative capacities of the DIA, RCA and MoH need to be further strengthened | | |
| Article 5 - Production process | | |
| Article description: <ul style="list-style-type: none"> It deals with the production processes for mercury and mercury compounds. It prohibits the use of mercury or mercury compounds in production processes. Every country should record relevant information on the processes in which mercury or mercury compounds are used. The use of mercury or mercury compounds is prohibited in a plant that did not exist before the Convention. | | |
| Summary of relevant provisions: <ul style="list-style-type: none"> Do not allow the use of mercury or mercury compounds in the production processes listed in Part I of Annex B. Restrict (as set out in the Annex) the use of mercury in the processes listed in Part II of Annex B. Do not allow the operation of new plants using mercury in the processes listed in Annex B, except plants using a mercury catalyst in the production of polyurethane. For plants carrying out the processes listed in Annex B, identify and obtain information on the use of mercury or mercury compounds; control mercury emissions to air and releases to land and water. ✓ Dissuade from new uses of mercury in industrial processes. | | |
| Adopted policy measures and regulations that enable the country to comply with the above provisions: | | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: | |
| Law on Environment (“Official Gazette of Montenegro”, No. 52/16) | Article 49, paragraph 4: Metallic mercury used in the chlor-alkali industry, metallic mercury generated by natural gas purification, metallic mercury generated by non-ferrous metal ore extraction and smelting operations and metallic mercury generated from cinnabar are considered waste. Article 49, paragraph 3: It is prohibited to mix metallic mercury with other substances with the sole purpose of exporting metallic mercury. | |
| Law on Industrial Emissions (“Official Gazette of Montenegro”, No. 17/19) | The use of mercury and mercury compounds and mixtures of mercury in plants or appropriate production processes is prohibited. Exceptionally, the use of mercury and mercury compounds and mixtures of mercury in production processes is allowed in the production of: sodium, or potassium methylates and ethylates. | |
| Rulebook on the Conditions of Use and Release of Mercury and Mercury Compounds (“Official Gazette of Montenegro”, No. 068/19) | This Rulebook prescribes the conditions for the use and release of mercury, mercury compounds and mixtures of mercury in the production processes of sodium or potassium methylates and ethylates. | |

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| Rulebook on the Criteria for Determining the Best Available Techniques for Environmental Protection and the List of Pollutants from Industrial Plants ("Official Gazette of Montenegro", No. 035/19) | This Rulebook sets out the criteria for determining the best available techniques for environmental protection and the list of pollutants from industrial plants. |
| Unresolved aspects of regulations or policies that need to be addressed / developed to ensure compliance with the provisions of the Convention (only in relation to binding provisions): | |
| <ul style="list-style-type: none"> There are not any. | |
| Relevant national stakeholders: | |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> The main institution for transposing the relevant articles related to Article 5 is the MESPU. The Law on Industrial Emissions prohibits all processes that are not in accordance with the best available technologies (BAT) in the territory of Montenegro. In Montenegro, there are no production processes from Annex B of the Minamata Convention. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> The Department for Industrial Pollution Control and Chemicals Management, within the MESPU, has one employee who performs tasks related to industrial pollution. |
| EPA | Role with regard to the above provisions: <ul style="list-style-type: none"> The Licensing Sector of the Environmental Protection Agency is responsible for issuing integrated permits |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> The Licensing Sector of the Environmental Protection Agency has two employees, who are in charge of issuing integrated permits, which is considered sufficient capacity, given the number of existing facilities and the fact that a large number of new facilities is not expected. |
| Shortcomings in capacities at the national level that need to be addressed: | |
| <ul style="list-style-type: none"> The Environmental Protection Agency does not keep or update the register of pollutants, which is required by existing regulations in accordance with the E-PRTR Regulation and the PRTR Protocol. In order to better understand BREF and BAT documents for certain industries, additional professional training of MESPU, EPA and DIA officials is needed. The administrative capacity of the Directorate for Inspection Affairs is satisfactory, but it needs to be improved through the training of inspectors in the field of industrial pollution. | |
| Article 6 - Available exemptions | |
| Article description: | |
| <ul style="list-style-type: none"> It deals with exemptions available to the contracting party upon request. Each Contracting Party may apply for one or more exemptions from the date of phasing out, which will expire five years after the request. Each Contracting Party should submit a comprehensive and sufficient report justifying the need to extend the phase-out deadline. | |
| Summary of relevant provisions: | |
| Not applicable. | |
| Adopted policy measures and regulations that enable the country to comply with the above provisions: | |

| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
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| Not applicable. | |
| Regulation on the Manner and Procedure for the Establishment of the System of Taking, Collecting and Treatment of Waste Deriving from Electrical and Electronic Products and on the System Functions ("Official Gazette of Montenegro", No. 39/12 and 47/12) | <p>In accordance with Article 4, the following equipment is exempted from all obligations under the Regulation:</p> <ul style="list-style-type: none"> • State security equipment • Weapons, ammunition and other equipment used exclusively for military purposes, and space equipment |
| Minamata Convention - clarification of the available procedure | <p>Contracting Parties may apply for a five-year deadline extension if the phasing out of the use of mercury in products and processes is prescribed (as set out in Annexes A and B). They may exercise this right when they become Contracting Parties or when new products or processes are added to the Convention. The Contracting Parties must explain why they need an extension.</p> <p>The same as the Stockholm Convention, the Minamata Convention will also establish a publicly available register of exemptions, which will include a list of countries that have requested an exemption and the dates when those exemptions expire.</p> |
| Unresolved aspects of regulations or policies that need to be addressed / developed to ensure compliance with the provisions of the Convention (only in relation to binding provisions): | |
| <ul style="list-style-type: none"> • The Government of Montenegro has not yet applied for an exemption, but Montenegro reserves the right to apply for it in the future if it wishes so. | |
| Relevant national stakeholders: | |
| MESPU | <p>Role with regard to the above provisions: The Ministry of Ecology, Spatial Planning and Urbanism (MESPU) is a focal point for the Convention and it is responsible for submitting a request for exemption to the Secretariat of the Convention on behalf of the Government of Montenegro.</p> |
| | <p>Existence of adequate institutional capacity to comply with the above provisions:</p> <ul style="list-style-type: none"> • Not relevant. |
| | <p>Existence of adequate institutional capacity to comply with the above provisions:</p> <ul style="list-style-type: none"> • Not relevant. |
| Article 7 - Artisanal mining and small-scale gold mining | |
| <p>Article description:</p> <ul style="list-style-type: none"> • It deals with artisanal mining and small-scale gold mining. • Each Contracting Party which exploits gold on a small scale in its territory should reduce the use of mercury and mercury compounds in mining and processing. | |
| <p>Summary of relevant provisions: <u>Take measures to reduce and, where feasible, eliminate the use of mercury and mercury compounds, emissions (into the air) and discharges (into land and water) in connection with artisanal mining and small-scale gold mining.</u></p> | |
| Adopted policy measures and regulations that enable the country to comply with the above provisions: | |

| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
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| Law on Environment ("Official Gazette of Montenegro", No. 52/16) | Article 49, paragraph 5: Waste referred to in paragraph 4 of this Article is disposed of in a manner that is safe for human health and the environment and in accordance with the law regulating waste management. |
| Rulebook on the Criteria for Determining the Best Available Techniques for Environmental Protection and The List of Pollutants from Industrial Plants ("Official Gazette of Montenegro", No. 035/19) | This Rulebook determines the criteria for determining the best available techniques, in order to protect the environment and the list of pollutants from industrial plants. |
| Law on Industrial Emissions ("Official Gazette of Montenegro", No. 17/19) | The use of mercury and mercury compounds and mixtures of mercury in plants or appropriate production processes is prohibited. Exceptionally, the use of mercury and mercury compounds and mixtures of mercury in production processes is allowed in the production of: sodium, or potassium methylates and ethylates. |
| Unresolved aspects of regulations or policies that need to be addressed / developed to ensure compliance with the provisions of the Convention (only in relation to binding provisions): | |
| <ul style="list-style-type: none"> There are not any. | |
| Relevant national stakeholders: | |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> The main institution for transposing the relevant articles concerning Article 7 is the MESPU. There is no artisanal mining and small-scale gold mining in Montenegro. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> Not relevant. |
| MED | <ul style="list-style-type: none"> Law on Mining ("Official Gazette of Montenegro", No. 65/08, 40/11) regulates the conditions and manner of exploitation of mineral wealth, mining measurements and mining plans, education of workers who manage technical work during exploitation, safety measures at work and environmental protection measures during mining operations as well as other issues of importance for the exploitation of mineral resources. |
| Article 8 - Emissions | |
| Article description: | |
| <ul style="list-style-type: none"> It deals with mercury emissions. It deals with the control and reduction of emissions of mercury and mercury compounds. Every Contracting State should take pollution control measures and draft a national plan to achieve the expected target value and target for mercury emissions, using the best available techniques. Emissions should be reduced no later than five years after the date of entry into force of the Convention. | |
| Summary of relevant provisions: | |
| <ul style="list-style-type: none"> <u>Require best available techniques / best environmental practices (BAT / BEP) or related emission limit values (ELV) for new sources (as set out in Article 8, paragraph 2, item (c) listed in Annex D (Coal-fired power plants, coal-fired industrial boilers, smelting and combustion processes used in the production of non-ferrous metals, waste incinerators and cement production)).</u> | |

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| <p>Require the implementation of one or more measures set out in Article 8 paragraph 5 in order to control / reduce mercury emissions from existing sources listed in Annex D, which will be implemented at source within 10 years.</p> <ul style="list-style-type: none"> Require monitoring / reporting and otherwise establish an inventory for mercury emissions from the sources listed in Annex D. | |
| <p>Adopted policy measures and regulations that enable the country to comply with the above provisions:</p> | |
| <p>Name and reference / number of relevant policy measures and regulations, as well as date:</p> | <p>Explanation of aspects of the above provisions addressed by the policy / regulation measure:</p> |
| <p>Regulation on Limit Values for Air Pollutants Emissions from Stationary Sources ("Official Gazette of Montenegro" No. 10/11)</p> | <p>This regulation regulates the limit values of emissions of pollutants and other measures of protection against emissions into the air from stationary sources and other sources related to air pollution. Article 12 prescribes emission limit values for powdered inorganic substances in waste gas, classified into hazard classes.</p> |
| <p>Rulebook on the Criteria for Determining the Best Available Techniques for Environmental Protection and the List of Pollutants from Industrial Plants ("Official Gazette of Montenegro", No. 035/19)</p> | <p>This Rulebook determines the criteria for determining the best available techniques, in order to protect the environment and the list of pollutants from industrial plants.</p> |
| <p>Unresolved aspects of regulations or policies that need to be addressed / developed</p> | |
| <ul style="list-style-type: none"> Develop an inventory of mercury and mercury emissions and update it regularly by the EPA as the competent authority. | |

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| Relevant national stakeholders: | |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> The main institution for transposing the relevant articles related to Article 8 is the MESPU, and the above articles have been transposed into legislation through the Law on Industrial Emissions - Rulebook on the Criteria for Determining Best Available Techniques for Environmental Protection and the List of Pollutants from Industrial Plants and Regulation on Limit Values for Air Pollutants Emissions from Stationary Sources. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> MESPU has one employee for industrial pollution and one for air pollution protection |
| EPA | Role with regard to the above provisions: <ul style="list-style-type: none"> The Agency is responsible for the implementation of the Law on Industrial Emissions, secondary legislation and administrative procedures related to the issuance of integrated permits, collection of data on pollutants, keeping Pollutant Release and Transfer Registers (PRTR) and reporting. The system for monitoring and reporting on the state of the environment falls within its area of responsibilities. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> There are 2 positions in the Agency envisaged by the systematization, which specifically concern the administrative procedures for issuing integrated permits. Both positions are filled. |
| DIA – Department of Environmental inspection | Role with regard to the above provisions: <ul style="list-style-type: none"> The Department of Environmental inspection is responsible for supervision over the implementation of environmental legislation, including regulations on industrial pollution. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> The Directorate for Inspection Affairs has 7 environmental inspectors who are responsible for all environmental issues, including industrial pollution issues. |
| IHS | EMEP monitoring on the transmission of pollution, including mercury through the air. |
| CETI | Role with regard to the above provisions: <ul style="list-style-type: none"> CETI is an accredited laboratory for measuring emissions in accordance with ISO 17025: 2006 and ISO 15675. In accordance with the scope of accreditation, they perform analyzes of mercury in samples of waste gas emissions. CETI also implements an annual program of air quality monitoring at measuring stations within the national network established for this purpose. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> Eleven CETI employees are responsible for field emissions measurement, verification and validation of data, as well as the implementation of data quality assurance programs from air quality measuring stations (QA / QC). |
| Shortcomings in capacities at the national level that need to be addressed before compliance with provisions can be possible: | |
| <ul style="list-style-type: none"> The capacity to inspect the implementation of legislation regulating air emissions is quite modest and needs to be improved. | |
| Article 9 - Emissions into water and land | |
| Article description: | |
| <ul style="list-style-type: none"> It deals with mercury emissions. Control and release of mercury and mercury compounds. | |

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| <ul style="list-style-type: none"> • Every State should, within three years from the date of entry into force of the Convention, identify relevant releases of mercury into land, water and air. • If the source exceeds the maximum allowed emissions, the state should take measures to control emissions and develop a national plan to achieve the expected target values, targets and outcomes. • National mercury release control plans should be submitted to the Conference of the Contracting Parties no later than 4 years after the date of entry into force of the Convention. | |
| Summary of relevant provisions: <ul style="list-style-type: none"> ✓ Require reporting or otherwise obtain information, as needed, in order to identify significant sources of discharges of mercury / mercury compounds into land or water, and keep an inventory of discharges from identified sources. ✓ Take one or more measures referred to in Article 9, paragraph 5 in order to control / reduce the discharges of mercury and mercury compounds into land and water from significant sources which are identified. | |
| Adopted policy measures and regulations that enable the country to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| Regulation on Classification of Surface water and Groundwater ("Official Gazette of Montenegro", No. 2/07) which has ceased to be valid by the Regulation respecting the Cessation of the Regulation on Classification and Categorization of Surface water and Groundwater ("Official Gazette of Montenegro", No. 104 / 20) | This Regulation determines the classification and categorization of surface water and groundwater and coastal sea water in the Republic of Montenegro. |
| Rulebook on the Manner and Deadlines for Determining the Status of Surface Waters ("Official Gazette of Montenegro", No. 25/19) | This Rulebook prescribes the manner and deadlines for determining the status of surface waters, the manner of monitoring the chemical and ecological status of surface waters, the list of priority substances and measures which are to be implemented to improve the status of surface waters. |
| Rulebook on Permitted Quantities of Hazardous and Harmful Substances in Soil and Methods for Their Testing ("Official Gazette of Montenegro" No. 018/97) | This Rulebook determines the maximum permitted quantities of hazardous and harmful substances in the soil, which occur as a result of inappropriate use of fertilizers and plant protection products, as well as the release of harmful substances of various origins. Article 3 defines the maximum permitted concentrations (MPC) of hazardous and harmful substances. |
| Rulebook on quality and sanitary-technical conditions for wastewater discharge, manner and procedure of testing wastewater quality and content of the report on the determined wastewater quality ("Official Gazette of Montenegro", No. 056/19) | This Rulebook prescribes the quality and sanitary-technical conditions for the discharge of wastewater into the recipient and public sewerage, including requirements depending on the industry that discharges wastewater, the manner and procedure of testing wastewater quality, the minimum number of tests and the content of the report on wastewater quality. |
| Unresolved aspects of regulations or policies that need to be addressed / developed to ensure compliance with the provisions of the Convention (only in relation to binding provisions): | |
| <ul style="list-style-type: none"> • Develop and regularly update an inventory of mercury and mercury compounds. | |

| Relevant national stakeholders: | |
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| MAFWM | <p>Role with regard to the above provisions:</p> <ul style="list-style-type: none"> The Ministry of Agriculture, Forestry and Water Management is a relevant institution for drafting appropriate laws and secondary legislations related to mercury discharges into water and land. |
| | <p>Existence of adequate institutional capacity to comply with the above provisions:</p> <ul style="list-style-type: none"> The MAFWM has three employees in the Directorate for Water Management and a director, two of whom deal with, among other things, water quality issues. The MAFWM also has one employee in matters related to the implementation of agricultural land policy. |
| EPA | <p>Role with regard to the above provisions:</p> <ul style="list-style-type: none"> The system of monitoring and reporting on the state of the environment falls within the responsibilities of the EPA. The Agency prepares proposals for monitoring programs for individual segments of the environment and various areas, monitors the performance of systematic measurements, examines and evaluates indicators of the state of the environment and pollution, conducts cross-border monitoring, and analyzes information obtained through monitoring. Surface water and groundwater monitoring is performed in accordance with the Rulebook on the manner and deadlines for determining the status of surface waters ("Official Gazette of Montenegro", No. 25/19), and land (soil) monitoring is performed in accordance with the Rulebook on permitted quantities of hazardous and harmful substances in soil and methods for their testing. |
| | <p>Existence of adequate institutional capacity to comply with the above provisions:</p> <ul style="list-style-type: none"> The Agency has one employee for collecting and updating water quality data. |
| WA | <ul style="list-style-type: none"> providing and implementing measures and activities on protection of waters from pollution; issuing water acts; establishing and keeping water information system, water cadasters, register of waters of importance for Montenegro; monitoring of natural and other phenomena; competence over law enforcement; preparing expert basis for regulations, plans and programs adopted by the Government and the Ministry responsible for water affairs. |
| DFSVPA | <ul style="list-style-type: none"> It performs activities related to laws in the field of plant health protection, plant protection products, and plant nutrition products. Uncontrolled use of plant protection products and nutrients can lead to the deposition of mercury and other heavy metals, which are very persistent in the soil. |
| IHS | <p>IHS performs water analysis in accordance with the Water Monitoring Program and prepares reports with information if the source exceeds the maximum allowed emissions into water.</p> |
| CETI | <p>The Center has an accredited laboratory in accordance with ISO 17025: 2006 for water and soil analysis, and performs mercury analysis from environmental samples, according to the Soil Monitoring Program, and prepares reports with information if the source exceeds the maximum allowed emissions into water and soil.</p> |
| <p>Shortcomings in national capacity that need to be addressed before compliance with the provisions can be achieved:</p> <ul style="list-style-type: none"> In the area of water monitoring, there is a lack of qualified staff to meet data collection and validation requirements, as well as quality assurance and reporting. Quality inspection supervision on the entire territory of the state is limited to only two water inspectors in the Directorate for Inspection Affairs. | |
| <p>Article 10 - Environmentally friendly storage of mercury, which is not mercury waste</p> | |
| <p>Article description</p> | |

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| <ul style="list-style-type: none"> This article deals with the environmentally friendly storage of mercury. Any discharge of mercury waste should be carried out in an environmentally sound manner, taking into account all guidelines, and in accordance with the requirements of the Convention. | |
| Summary of relevant provisions: <ul style="list-style-type: none"> <u>Take measures to ensure that temporary storage of mercury is carried out in an environmentally sound manner, taking into account guidelines developed by the Conference of the Parties (COP).</u> | |
| Adopted policy measures and regulations that enable the country to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| Regulation on the Manner and Conditions of Waste Storage ("Official Gazette of Montenegro" No. 033/13, 065/15) | Article 4 of the Regulation prescribes that waste may be stored in an underground storage facility in accordance with procedure D12 and only at a location designated for that purpose on the basis of a risk assessment. Risk assessment is defined in Article 4, paragraphs 2, 3 and 4. Inspection of storage space falls within the competence of the environmental inspection. |
| Rulebook on the Criteria for Determining the Best Available Techniques for Environmental Protection and the List of Pollutants from Industrial Plants ("Official Gazette of Montenegro", No. 035/19) | This Rulebook determines the criteria for determining the best available techniques, in order to protect the environment and the list of pollutants from industrial plants. |
| Rulebook on the quantities of hazardous substances by categories that determine the degree of risk of Seveso plant ("Official Gazette of Montenegro", No. 63/2016) | This Rulebook describes the quantities of hazardous substances by categories used to determine the degree of risk of the Seveso plant. |
| Rulebook on the detailed content of the prevention plan and accident protection plan ("Official Gazette of Montenegro", No. 67/2016) | This Rulebook describes the detailed content of the accident prevention plan and the notification of the Seveso plant, the content and methodology for preparation of the safety report and the accident protection plan. |
| Unresolved aspects of regulations or policies that need to be addressed / developed | |
| <ul style="list-style-type: none"> There are not any. | |
| Relevant national stakeholders: | |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> MESPU is the relevant institution for drafting relevant laws and secondary legislation on environmentally friendly mercury storage. At the moment, there is no storage of mercury in Montenegro. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> Not relevant. |
| DIA | Role with regard to the above provisions: <ul style="list-style-type: none"> Inspection of chemical storage facilities falls within the competence of the Directorate for Inspection Affairs. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> Not relevant. |
| Article 11 - Mercury-containing waste | |
| Article description: | |

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| <ul style="list-style-type: none"> • It deals with the relevant definition of mercury waste and its treatment. • All mercury waste should be disposed of in accordance with the provisions of domestic law or the Convention, with the exception of overburden, barren rock and tailings. | |
| Summary of relevant provisions: <ul style="list-style-type: none"> ✓ <u>Use a definition of mercury-containing waste in accordance with Article 11.2.</u> ✓ <u>Take measures to manage mercury-containing waste in an environmentally sound manner, taking into account guidelines prepared in accordance with the Basel Convention and in accordance with the requirements of the Conference of the Parties (COP) which are to be determined.</u> ✓ Take measures to limit the use of mercury derived from the treatment or reuse of mercury waste to permitted uses in accordance with the Convention or to environmentally sound disposal. ✓ <u>Require transport across international borders in accordance with the Basel Convention, and in the event that the Basel Convention does not apply, in accordance with international rules, standards and guidelines.</u> | |
| Existing policy measures and regulations that enable the country to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| Law on Environment (“Official Gazette of Montenegro”, No. 52/16) | Article 49, paragraph 4: Waste is considered to be metallic mercury which is used in the chlor-alkali industry, metallic mercury obtained by purification of natural gas, metallic mercury obtained by exploitation of non-ferrous metals and smelting of non-ferrous metals and metallic mercury obtained from cinnabar. Article 49, paragraph 5: Waste referred to in paragraph 4 of this Article is disposed of in a manner that is safe for human health and the environment. |
| Regulation on the Manner and Conditions of Waste Storage (“Official Gazette of Montenegro” No. 033/13, 065/15) | Waste is stored in temporary storage facilities, waste processors' storage facilities and underground storage facilities under the conditions set out in this Regulation. This Regulation applies to all types of waste, except for temporary storage of municipal waste, in accordance with Article 78 of the Law on Waste Management. |
| Law on Ratification of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (“Official Gazette of Serbia and Montenegro”, No. 22/99) | The EPA and the Revenue and Customs Administration fully implement the provisions of the Basel Convention on the control of transboundary movements of hazardous wastes and their disposal. |
| Rulebook on the detailed content of the documentation submitted with the application for a permit for import, export and transit of waste, the list of waste classification and the content and manner of keeping the register of issued permits (“Official Gazette of Montenegro”, No. 083/16, 076/17) | This Rulebook determines more closely the content of the documentation submitted with the application for a permit for import, export and transit of waste, the list of waste classification and the content, form and manner of keeping the register of issued permits for transboundary movement of waste. |
| Specific aspects in terms of policies or regulations that should be addressed / developed | |
| <ul style="list-style-type: none"> • Define measures to ensure that mercury derived from the treatment or reuse of mercury waste cannot be used in a manner prohibited by the Convention. | |
| Relevant national stakeholders: | |

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| MESPU | <p>Role with regard to the above provisions:</p> <ul style="list-style-type: none"> MESPU is the body responsible for drafting and adopting appropriate acts on waste management. The above articles have been transposed through the Law on Waste Management - Regulation on the Manner and Conditions of Waste Storage, the Law on Ratification of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal and the Law on the Environment. |
| | <p>Existence of adequate institutional capacity to comply with the above provisions:</p> <ul style="list-style-type: none"> Five MESPU employees are engaged in waste management. |
| DIA | <p>Role with regard to the above provisions:</p> <ul style="list-style-type: none"> DIA – Department of Environmental inspection is the responsible body for performing inspection over the implementation of legislation in the field of waste management, while at the local level, municipal inspectors are responsible for certain types of supervision in the field of municipal waste management. Along with the environmental inspectors, the implementation of the Law on Waste Management is also performed by communal, phytosanitary, forestry, electric power, mining, and traffic and market inspectors. |
| | <p>Existence of adequate institutional capacity to comply with the above provisions:</p> <ul style="list-style-type: none"> The Directorate has 7 environmental inspectors, whose responsibilities cover all issues related to environmental protection in all sub-sectors, including the waste management sub-sector. Inspection supervision for certain types of waste includes market, mining, veterinary, phytosanitary, forestry, traffic inspection and inspection in the field of electric power. |
| EPA | <p>Role with regard to the above provisions:</p> <ul style="list-style-type: none"> The Agency is responsible for conducting administrative procedures and issuing permits, collecting, processing and maintaining waste databases and reporting. |
| | <p>Existence of adequate institutional capacity to comply with the above provisions:</p> <ul style="list-style-type: none"> There are three systematized positions in the EPA for conducting administrative procedures for issuing permits, collecting and updating data on all types of waste and reporting to national, international and European institutions. |
| 4. MONSTAT – Statistical Office of Montenegro | <p>Role with regard to the above provisions:</p> <ul style="list-style-type: none"> MONSTAT is the institution responsible for collecting and statistical processing of data on certain types and quantities of waste, as well as for reporting to EUROSTAT. |
| | <p>Existence of adequate institutional capacity to comply with the above provisions:</p> <ul style="list-style-type: none"> One MONSTAT employee deals with waste statistics. |
| <p>Shortcomings in national capacity that need to be addressed before compliance with the provisions can be achieved:</p> <ul style="list-style-type: none"> The employee structure in the Department for Waste Management in MESPU does not include the position of a qualified lawyer who would work on transposing the EU acquis and drafting corresponding domestic regulations. The administrative capacity of the EPA for administrative procedures related to the issuance of permits, collection and updating of data on all types of waste and reporting to national, international and European institutions is adequate, but it is necessary to provide additional training. The centralized system for collection of data on the types and quantities of waste is still not at a satisfactory level. | |
| <p>Article 12 - Contaminated sites</p> | |
| <p>Article description:</p> <ul style="list-style-type: none"> It deals with the treatment of contaminated sites. | |

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| <ul style="list-style-type: none"> • Every country should develop adequate strategies for identification and assessment of sites contaminated with mercury or mercury compounds in an environmentally sound manner. • Treatment of contaminated sites should include a risk assessment for human health. | |
| Summary of provisions relevant to Montenegro: <ul style="list-style-type: none"> ✓ Develop strategies for identification and assessment of sites contaminated with mercury / mercury compounds. ✓ <u>If risk reduction activities are carried out at contaminated sites, they are carried out in an environmentally sound manner and include a risk assessment if necessary.</u> | |
| Existing policy measures and regulations that enable the country to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| Law on Environment (“Official Gazette of Montenegro”, No. 52/19) | This law regulates: the principles of environmental protection and sustainable development, subjects and instruments of environmental protection, public participation in environmental issues and other issues of importance for the environment. |
| Law on Liability for Environmental Damage (“Official Gazette of Montenegro”, No. 27/14, 55/16) | This law regulates the manner and procedure of determining liability for environmental damage, as well as the application of preventive and remediation measures to prevent and eliminate environmental damage. |
| Rulebook on the detailed content of the prevention plan and accident protection plan (“Official Gazette of Montenegro”, No. 67/16) | This Rulebook prescribes the detailed content of the accident prevention plan and the notification of the Seveso plant, the content and methodology for preparation of the safety report and the accident protection plan. |
| Specific aspects in terms of policies or regulations that should be addressed : | |
| <ul style="list-style-type: none"> • There are no identified sites that could be contaminated with mercury / mercury compounds. | |
| Relevant national stakeholders: | |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> • MESPU is the responsible body for drafting and adopting appropriate legal acts concerning the treatment of contaminated sites. Currently, the main legal acts are the Law on Liability for Environmental Damage and the Law on the Environment. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> • Not relevant. |
| DIA– Department of Environmental inspection | Role with regard to the above provisions: <ul style="list-style-type: none"> • DIA – Department of Environmental inspection is responsible for the inspection and control of all activities arising from the treatment of contaminated sites. If the pollution is in the natural flow of water, then the water inspection is responsible. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> • Not relevant. |
| EPA | Role with regard to the above provisions: <ul style="list-style-type: none"> • The Agency is the competent authority for the implementation of legislation related to the treatment of contaminated sites, through the approval of appropriate methods and studies for remediation, which include risks to human health. |
| Article 13 - Financial resources and mechanisms | |
| Article description: | |
| <ul style="list-style-type: none"> ✓ It emphasizes the issue of financial resources and mechanisms to reduce mercury pollution. | |

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| <ul style="list-style-type: none"> ✓ Funds for pollution reduction should come from domestic sources, through relevant policies and the national budget, as well as from bilateral and multilateral sources. ✓ The private sector should be involved through the introduction of taxes. | |
| Summary of relevant provisions: <ul style="list-style-type: none"> • <u>Access to domestic financial resources, when needed, in order to meet the obligations of the Convention.</u> • <u>Access to financial resources which are available under the financial mechanisms related to the Convention, as well as other resources available from multilateral, regional and bilateral sources.</u> | |
| Existing policy measures and regulations that enable the country to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| Law on Environment ("Official Gazette of Montenegro", No. 52/16) | Chapter XXII (Articles 74-79) defines the financing of environmental protection. Article 74 prescribes that the state and local self-government units provide financial resources for the protection and improvement of the environment. Other articles in this chapter define: sources of financing, eco fund, eco-fees, use of funds, fees for protection and improvement of the environment at the local level. |
| Decision on the Establishment of the Environmental Protection Fund ("Official Gazette of Montenegro", No. 081/18, 005/20) | The activity of the Eco Fund is financing the preparation, implementation and development of programs, projects and similar activities in the field of conservation, sustainable use, protection and improvement of the environment, energy efficiency and use of renewable sources and energy at the state and local level. |
| Specific aspects in terms of policies or regulations that should be addressed / developed to ensure compliance with the provisions of the Convention (only in relation to binding provisions): | |
| <ul style="list-style-type: none"> • Funds for the implementation of measures defined by the Action Plan of the National Implementation Plan of the Minamata Convention should be earmarked in the state budget or provided from projects with donors. | |
| Relevant national stakeholders: | |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> • MESPU is the body responsible for the preparation of financial instruments in the field of environmental protection. Also, as a focal point for numerous international conventions, the MESPU is the main body for multilateral (GEF) and EU funding (IPA). • Furthermore, based on Article 76 of the Law on Environment, the Government of Montenegro established the Eco-Fund. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> • Not relevant. |
| Shortcomings in national capacity that need to be addressed before compliance with the provisions can be achieved: | |
| <ul style="list-style-type: none"> • There are not any. | |
| Article 14 - Capacity building, technical assistance and technology transfer | |
| Article description: <ul style="list-style-type: none"> • It deals with issues of capacity building, technical assistance and technology transfer related to mercury compounds. • States should cooperate to ensure timely and appropriate capacity building and technical assistance to developing countries which are Contracting Parties through regional and national arrangements. | |
| Summary of relevant provisions Not available | |

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| Existing policy measures and regulations that enable the country to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| Not applicable. | |
| Specific aspects in terms of policies or regulations that should be addressed / developed to ensure compliance with the provisions of the Convention (only in relation to binding provisions): | |
| <ul style="list-style-type: none"> Establishment of regular channels for cooperation with state bodies of more developed countries which are contracting parties, in order to transfer knowledge. Financial sources designated to strengthen the capacity of state bodies should be defined and included in their annual budgets. | |
| Relevant national stakeholders: | |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> As a focal point for the Minamata Convention, MESPU is a relevant institution for capacity building, technical assistance and technology transfer related to mercury compounds, when it comes to all relevant stakeholders for the Minamata Convention in Montenegro. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> Not relevant. |
| Article 16 - Health aspects | |
| Article description: | |
| <ul style="list-style-type: none"> ✓ It refers to health aspects. ✓ It encourages states to promote strategies to identify populations affected by mercury pollution. It encourages states to adopt health guidelines on mercury exposure and provide education on mercury hazards. States should provide adequate health care protection in terms of the treatment and care of persons who already exposed to mercury compounds. | |
| Summary of relevant provisions: | |
| <ul style="list-style-type: none"> Promote the development and implementation of strategies for the identification and protection of populations at risk, e.g. drafting guidelines for fish consumption. Promote education and prevention programs on occupational exposure. Promote prevention, treatment and care services for affected groups. | |
| Existing policy measures and regulations that enable the country to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| National Chemicals Management Strategy 2019-2022, with an Action Plan for the period 2019-2022. | |
| Specific aspects in terms of policies or regulations that should be addressed : | |
| <ul style="list-style-type: none"> Prepare informative guidelines, for example, on occupational exposure. The results of the examination of fish represented on the domestic market should be available to the public. | |
| Relevant national stakeholders: | |
| MoH | Role with regard to the above provisions: |

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| | <ul style="list-style-type: none"> The Ministry of Health is responsible for monitoring the environmental protection measures that affect the health of citizens. It performs safety assessment and conformity assessment of a cosmetic product before placing it on the market, for the safety and protection of human life and health. |
| | <p>Existence of adequate institutional capacity to comply with the above provisions:</p> <ul style="list-style-type: none"> Not relevant. |
| DFSVPA | The Sector for Food Safety in the Directorate for Food Safety, Veterinary and Phytosanitary Affairs performs the tasks of the Directorate related to: safety of food of animal origin, safety of food for animals, safety of food of non-animal origin, by-products of animal origin, preparation of expert bases, implementation, harmonization and monitoring of regulations and conditions in these areas; issuance of professional guidelines, brochures, manuals, instructions and measures; determining and monitoring the fulfillment of conditions for performing activities; establishment and keeping of a central register of approved and registered food and feed facilities; it participates in: the work of international institutions in this field; financial planning, preparation of planning documents, strategies, reports, analyzes, information and other materials; it gives expert opinions and performs other tasks determined in the competence. |
| Article 17 - Exchange of information | |
| Article description: | |
| <ul style="list-style-type: none"> It refers to the exchange of information to facilitate the reduction of mercury pollution. Every Contracting State should exchange information concerning mercury and mercury compounds, about activities and processes involving the emission or release of mercury or mercury compounds, in order to obtain the most efficient and effective instruments for the exchange of information. | |
| Summary of relevant provisions: | |
| <ul style="list-style-type: none"> Collection and dissemination of information about annual quantities of mercury and mercury compounds emitted, released or disposed of, as well as other information referred to in Article 18. Exchange of information about health and safety of people and the environment as information that is not considered confidential, in accordance with the provisions of Article 17.5. Reporting to the Conference of the Parties on progress in fulfilling the obligations under Article 21 of the Convention - designated National Focal Point (NFP). | |
| Existing policy measures and regulations that enable the country to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| Law on Environment ("Official Gazette of Montenegro", No. 52/16) | Articles 66-69 define what environmental information should include, as well as manners of publishing environmental information, and requirements and deadlines for providing environmental information. |
| Specific aspects in terms of policies or regulations that should be addressed / developed to ensure compliance with the provisions of the Convention (only in relation to binding provisions): | |
| <ul style="list-style-type: none"> Establishment of regular channels for the exchange of information on mercury and mercury compounds with other Contracting Parties, primarily those in the region. | |
| Relevant national stakeholders: | |
| EPA | Role with regard to the above provisions: |

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| | <ul style="list-style-type: none"> According to the Law on Environment, the Environmental Protection Agency is the body responsible for collecting and disseminating information on annual quantities of mercury and mercury compounds that are emitted, released or disposed of. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> Not relevant. |
| MoH | Role with regard to the above provisions: <ul style="list-style-type: none"> The Ministry of Health is a relevant institution for disseminating information on human health and safety. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> Not relevant. |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> As a focal point for the Convention, the MESPU will report to the Conference of the Parties on progress in meeting its obligations under the Convention. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> Not relevant. |
| Article 18 - Informing the public, level of awareness and education | |
| Article description: | |
| <ul style="list-style-type: none"> It emphasizes the importance of informing the public in order to raise awareness and educate the population. | |
| Summary of relevant provisions: | |
| <ul style="list-style-type: none"> Collection and dissemination of information on annual quantities of mercury and mercury compounds emitted, released or disposed of, as well as other information referred to in Article 18. <u>Exchange of information about health and safety of people and the environment as information that is not considered confidential, in accordance with the provisions of Article 17.5.</u> Reporting to the Conference of the Parties on progress in fulfilling the obligations under Article 21 of the Convention. | |
| Existing policy measures and regulations that enable the country to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| Law on Environment ("Official Gazette of Montenegro", No. 52/16) | <p>State administration bodies, administration bodies and local administration bodies responsible for environmental protection are obliged to timely inform the public and the interested public about decision-making procedures in environmental matters relating to:</p> <ol style="list-style-type: none"> 1) strategic assessment of the impact of plans and programs on the environment; 2) environmental impact assessment; 3) the procedure for issuing permits for integrated pollution prevention and control through the approval of the operation of new or existing facilities; 4) strategies, plans, programs and other documents in the field of environmental protection; 5) Other issues in the field of environment in accordance with special regulations. |
| Specific aspects in terms of policies or regulations that should be addressed | |
| <ul style="list-style-type: none"> Organizing educational events and other methods for raising awareness in order to educate the general public about the dangers of exposure to mercury and mercury compounds. | |

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| <ul style="list-style-type: none"> • Develop and regularly update an adequate inventory of releases of mercury and mercury compounds. • Annually present information on emitted quantities of mercury and mercury compounds. | |
| Article 19 - Research, development and monitoring | |
| Article description: | |
| <ul style="list-style-type: none"> • The need for cooperation is stated in order to work on reducing mercury pollution and improving the situation. | |
| Summary of relevant provisions: | |
| Not applicable. | |
| Existing policy measures and regulations that enable the country to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| Not applicable. | |
| Specific aspects in terms of policies or regulations that should be addressed / developed to ensure compliance with the provisions of the Convention (only in relation to binding provisions): | |
| <ul style="list-style-type: none"> • There are not any. | |
| Relevant national stakeholders: | |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> • As a focal point for the Convention, the MESPU will cooperate with other parties in research, development and monitoring, as prescribed by Article 19. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> • The MESPU has plans to develop bio-monitoring capacities for mercury; transmission (including far-reaching transfer and deposition), transformation and future of mercury and mercury compounds in a range of ecosystems. |
| MESCS | Role with regard to the above provisions: <ul style="list-style-type: none"> • The then Ministry of Science (2015) established the Center for Bioinformatics, with numerous faculties and institutes, with one of the main goals being modern bio-monitoring. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> • This center should be developed in the coming years, through various activities, which should be supported from domestic and international sources of funding. |
| Article 21 - Reporting | |
| Article description: | |
| <ul style="list-style-type: none"> • It notes that every Contracting Party participates in the Conference of the Parties and should report through the Secretariat on the measures taken and their effectiveness. | |
| Summary of relevant provisions | |
| <ul style="list-style-type: none"> • Full participation in the COP, including voting, if necessary. • Participation in one of the specified dispute resolution processes, when needed, in accordance with Article 25 of the Convention. • Determine the manner in which future amendments to the Annexes to the Convention will be ratified, in accordance with Article 30.5 of the Convention. | |

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| <ul style="list-style-type: none"> Reporting to the COP on progress in implementing the obligations arising from the Convention, in accordance with Article 21 of the Convention. | |
| Existing policy measures and regulations that enable the country to comply with the above provisions: | |
| Name and reference / number of relevant policy measures and regulations, as well as date: | Explanation of aspects of the above provisions addressed by the policy / regulation measure: |
| Law on Environment ("Official Gazette of Montenegro", No. 52/16) | <p>Although not directly applicable, the provisions of the Law on Environment relating to reporting may be applied to some extent.</p> <p>Article 60: In order to monitor the achievement of goals set by strategic, planning and program documents related to environmental protection, as well as due to the overall insight into the state of the environment, the Environmental Protection Agency prepares a Report on the State of the Environment for the period of four years.</p> <p>The report on the state of the environment is prepared on the basis of the National List of Environmental Indicators established by the Government. An integral part of the Report on the State of the Environment is the Action Plan for the Improvement of the State of the Environment with proposed measures.</p> <p>The report is submitted to the Government.</p> |
| Specific aspects in terms of policies or regulations that should be addressed | |
| <ul style="list-style-type: none"> Include a section on mercury in the existing draft Report on the State of the Environment prepared by the EPA and update the data every year. Use the previous section of the draft Report to prepare a report for the Conference of the Parties. | |
| Relevant national stakeholders: | |
| MESPU | Role with regard to the above provisions: <ul style="list-style-type: none"> As a focal point in the Convention, the MESPU is obliged to report to the Conference of the Parties, through the Secretariat, on the measures taken to implement the provisions of the Convention and on the effectiveness of these measures and possible challenges in achieving the Convention's objectives. |
| | Existence of adequate institutional capacity to comply with the above provisions: <ul style="list-style-type: none"> Not relevant. |