



Distr.: General
3 January 2023

English only



**United Nations
Environment
Programme**

UNEP Global Mercury Partnership

Advisory Group

Thirteenth meeting

9 and 10 November 2022, Paris (France) and online

**Report on activities undertaken within the United Nations
Environment Programme Global Mercury Partnership**

Note by the secretariat

The Overarching Framework of the UNEP Global Mercury Partnership outlines that one of the functions and responsibilities of the Partnership Advisory Group is to report on activities undertaken within the Partnership.

The annex to the present note sets out a report on such activities during the period from December 2020 to October 2022. The report provides an overview of overarching activities undertaken by the Partnership. On the basis of input received from the leads and co-leads of each Partnership area, it also presents highlights of Partnership area activities during the reporting period, as well as of future work planned.

Annex

Report on activities undertaken within the United Nations Environment Programme Global Mercury Partnership (December 2020 to October 2022)

I. Introduction

Initiated in 2005 by a decision of the United Nations Environment Programme (UNEP) Governing Council¹, the Global Mercury Partnership (hereinafter referred to as the “Partnership”) focuses on supporting timely and effective implementation of the Minamata Convention on Mercury, on providing state of the art knowledge and science on mercury, and on delivering outreach and awareness raising towards global action on mercury.

The Partnership is structured around eight priorities for action or so-called “Partnership areas”, namely: artisanal and small-scale gold mining (ASGM), mercury cell chlor-alkali production, mercury air transport and fate research, mercury in products, mercury releases from coal combustion, mercury waste management, mercury supply and storage, and mercury releases from the cement industry.

The present report provides an overview of overarching activities undertaken by the Partnership during the period from December 2020 to October 2022, including on work conducted in a cross-cutting manner amongst Partnership areas pursuant to decisions of the Partnership Advisory Group (PAG), as well as work in support to decisions of the Conference of the Parties to the Minamata Convention. On the basis of input received from each Partnership area, it also presents highlights of Partnership areas activities during the reporting period, as well as some of the future work planned.

II. Overview

Participation

The number of partners of the Global Mercury Partnership is steadily growing:

- As of 31 October 2022, there were 241 members of the Partnership, including 37 governments, 11 international organizations, 78 non-governmental organizations, 58 industry/private sector as well as 57 academia and others.
- Some partners are global industry associations or federations of civil society organizations that collaborate with and represent a larger number of national entities/associations. In addition, the Partnership works with a number of stakeholders that have not yet officially joined. The Partnership also closely collaborates with the Secretariat of the Minamata Convention as well as with a number of UN agencies.

Organisation

Leads of individual Partnership areas are:

- **Artisanal and small-scale gold mining (ASGM):** The Natural Resources Defence Council (NRDC), the United Nations Environment Programme (UNEP) and the United Nations Industrial Development Organization (UNIDO);
- **Mercury cell chlor-alkali production:** The Environmental Protection Agency of the United States and the United Nations Industrial Development Organization (UNIDO);
- **Mercury air transport and fate research:** The National Research Council (CNR)² - Institute of Atmospheric Pollution Research, Italy, the Biodiversity Research Institute (BRI) and the Dartmouth College;
- **Mercury in products:** The Environmental Protection Agency of the United States;
- **Mercury releases from coal combustion:** The International Centre for Sustainable Carbon (ICSC) and the Macquarie University (Australia);

¹ UNEP Governing Council Decision 23/9

² Consiglio Nazionale delle Ricerche

- **Mercury waste management:** The Ministry of the Environment of Japan and Misuzu Asari, Graduate School of Global Environmental Studies, Kyoto University (Japan);
- **Mercury supply and storage:** The Ministry for the Ecological Transition³ of Spain and the Ministry of Housing, Territorial Planning and Environment⁴ of Uruguay;
- **Mercury releases from the cement industry:** The Global Cement and Concrete Association (GCCA) and the Ministry of Climate Change of Pakistan.

Partnership Advisory Group

The Overarching Framework of the Partnership establishes a Partnership Advisory Group (PAG) to, amongst others, serve the Partnership and encourage the work of its Partnership areas. Its membership includes Partnership area leads, partners nominated by the Partnership areas and other representatives. Observers may also attend meetings of the PAG.

During the reporting period, the PAG held its eleventh (15 and 16 December 2020, online)⁵ and twelfth meeting (11 and 14 March 2022, online)⁶, under the leadership of the PAG co-chairs, Rodges Ankrah, Environmental Protection Agency of the United States, and Teeraporn Wiriwutikorn, Ministry of Natural Resources and Environment of Thailand, further to their designation at PAG-10 (23 November 2019, Geneva)⁷.

III. Highlight of overarching activities

A number of awareness-raising, information dissemination, experience-sharing as well as cross-cutting activities have been conducted during the current reporting period, including pursuant to decisions of the Partnership Advisory Group at its the eleventh and twelfth meetings. The Partnership also supported intersessional work towards meetings of the Conference of the Parties to the Minamata Convention.

Awareness-raising, information dissemination and experience-sharing activities

Webinars to support sharing of information and experience: the Partnership continued to roll out a series of webinars to support sharing of information and experience. Interests and priority topics were identified through needs expressed in the context of meetings of the PAG and of Partnership areas, as well as through an online survey conducted by the Secretariat of the Partnership in April 2020. The following events have been organized during the current reporting period (further information about these events may be found on the Partnership website)⁸:

- In the context of the 2020 deadline for phase out under the Minamata Convention, and in follow up to online sessions organized in 2020 on mercury-containing medical devices and mercury in skin-lightening products in cooperation with the World Health Organization (WHO), the Partnership and its areas of work on mercury in products and on mercury waste management jointly organized an online session dedicated to the phase out of mercury-containing lamps in December 2021.
- In relation to ASGM, the Partnership and its area of work on ASGM organized an online webinar to discuss gender mainstreaming into National Action Plans (NAPs) in June 2021, and together with the planetGOLD Programme, jointly organized an online session dedicated to best management practices in the use of cyanide in January 2022.
- The Partnership and its waste management area organized an online information-sharing session dedicated to mercury wastes management for the implementation of Article 11 of the Minamata Convention in February 2022, which introduced available resources and technologies for treating mercury wastes, featuring experience in different parts of the world.
- Side events were organized in November 2021 in the margins of the first segment of COP4 (1 to 5 November 2021). The Partnership area on ASGM and the Secretariat of the Minamata Convention co-hosted a side event on the sound management of mercury-containing tailings in ASGM and the Partnership area on mercury air transport and fate research together with the Biodiversity Research Institute (BRI) organized a side event on the Guidance on monitoring of mercury and mercury compounds to support the effectiveness evaluation of the Convention.

³ “Ministerio para la Transición Ecológica”

⁴ “Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente”

⁵ <https://www.unep.org/globalmercurypartnership/events/unep-event/partnership-advisory-group-meeting-11>

⁶ <https://www.unep.org/globalmercurypartnership/events/unep-event/partnership-advisory-group-meeting-12>

⁷ <https://www.unep.org/globalmercurypartnership/events/unep-event/partnership-advisory-group-meeting-10>

⁸ www.unep.org/globalmercurypartnership/events

- In June 2022, as part of the meetings of the Conference of the Parties to the Basel, Rotterdam and Stockholm Conventions, the Partnership and its areas of work on Mercury Waste Management and Mercury Supply and Storage, as well as the Minamata Convention Secretariat, organized a side event on “Mercury Wastes: latest developments, tools and practices for their environmentally sound management”.
- Jointly organized by the Partnership and its area of work on Mercury Releases from the Cement Industry, a webinar on “Best practices to reduce mercury emissions from the cement industry” was held to exchange on current knowledge about best approaches to control and reduce emissions of mercury from the cement sector and share information on existing guidance was also held in June 2022.
- With regards to Minamata Initial Assessments (MIAs), the Partnership held, in September 2022, an information sharing session on “Minamata Initial Assessments: latest trends, key findings and data analysis tools”, to present initial analysis of data compiled from more than 70 national mercury inventories and discuss ongoing efforts to strengthen the UNEP Mercury Inventory Toolkit’s mass balance approach.
- The Partnership also contributed to several “Minamata Online” sessions⁹, including on mercury emissions from coal was co-organized by the Partnership area on mercury releases from coal combustion together with the Secretariat of the Minamata Convention and the International Conference on Mercury as a Global Pollutant in November 2021, and on technical guidelines on mercury waste management together with the area of work on Mercury Waste Management in October 2022.

The Partnership Newsletter launched in 2020 in order to enhance communication and outreach was rolled out on a quarterly basis. The Newsletter features highlights by Partnership areas and partners, relevant resources and publications, introduction of new partners, upcoming and past events, and is being circulated to all partners and interested stakeholders.

In the framework of the third Round of applications to the Specific International Programme of the Minamata Convention, the Secretariat of the Partnership also contributed to the review process of project proposals submitted by Parties through the provision of technical input and the participation in Cross-Secretariat Task Team meetings, together with the secretariats of the Minamata Convention, Global Environment Facility (GEF) and the Special Programme.

The Partnership website was migrated to a new content management platform in the last quarter of 2021. The new site is accessible at www.unep.org/globalmercurypartnership and offers new features to showcase information in a dynamic and user-friendly manner.

Cross-cutting work on mercury from oil and gas and from non-ferrous metals

Pursuant to the decision of the PAG at its tenth meeting (Geneva, 23 November 2019), the Partnership had initiated work on mercury from non-ferrous metals mining and smelting and from oil and gas. In particular, technical study reports had been developed on these two topics, under the guidance of the PAG co-chairs, Partnership Areas co-leads and with input from interested partners and stakeholders¹⁰.

At its twelfth meeting, the PAG was presented by the lead authors of the reports, Peter Nelson (Macquarie University), and Lilian Corra (International Society of Doctors for the Environment – ISDE), major findings and areas identified where future work may be needed. Final versions of the reports were made available to the PAG which discussed next steps for future work¹¹.

Cooperation on intersessional work for meetings of the Conference of the Parties to the Minamata Convention

The third meeting of the Conference of the Parties to the Minamata Convention (Geneva, November 2019) called for cooperation with the Partnership on intersessional work on customs codes and on the management of tailings from ASGM in preparation for its fourth meeting. The Partnership area on mercury in products has hence collaborated with the Secretariat of the Minamata Convention to respond to the COP mandate on the issue of customs codes, in the development of a guidance document on their use in the context of the Convention (decision MC-3/3, documents UNEP/MC/COP.4/27 and UNEP/MC/COP.4/INF/5), and the Partnership area on ASGM has worked with the Secretariat of the

⁹ Documents UNEP/ Hg/PAG.13/4 and UNEP/ Hg/PAG.13/5 available at <http://www.mercuryconvention.org/Resources/MinamataOnline/tabid/8527/language/en-US/Default.aspx>

¹⁰ Further background on the development of the report may be found on the website of the Partnership at

<https://www.unep.org/globalmercurypartnership/node/26905/> and <https://www.unep.org/globalmercurypartnership/node/26904/>

¹¹ <https://www.unep.org/globalmercurypartnership/events/unep-event/partnership-advisory-group-meeting-13>

Minamata Convention to update the ASGM National Action Plan Guidance Document regarding management of tailings (decision MC-3/5, documents UNEP/MC/COP.4/6 and UNEP/MC/COP.4/INF/6). The Partnership also collaborated with the Secretariat of the Minamata Convention on developing tools to assist countries in the use of remote sensing to support ASGM policy development and implementation.

Through its Secretariat and its Partners, the Partnership is also expected to support intersessional work in preparation for COP5, as appropriate.

IV. Activity Report by Partnership area

1) Artisanal and small-scale gold mining (ASGM)

- a) The objectives of the Partnership area are the continued minimization and elimination, where feasible, of mercury uses and releases in artisanal and small-scale gold mining.

Lessons learnt and ways forward: Creating alternatives to mercury amalgamation remains a key challenge, one that is being tackled by many partners, as described in the section below. Alternatives should be affordable, cleaner and more efficient at extracting gold, a combination that is well recognized by international agencies, governments, NGOs and academics. However, such a major change in processing requires continuous efforts in formalization, access to finance, education and organization of miners. Bottom-up approaches, involving the miners, are essential.

- b) Key activities in the Partnership area include: (*The Partnership area chose to report on key activities by partners. Below are activities undertaken by partners during the reporting period. Joint work is displayed per project, in order to avoid repetition.*)

- GEF planetGOLD programme:
 - In early 2019 UNEP, UNIDO and NRDC launched the GEF GOLD programme, funded by the Global Environment Facility (GEF) and led by UNEP, in collaboration with a range of partners. The programme, now branded as planetGOLD, is helping gold miners replace toxic mercury with cleaner techniques, improving access to finance and facilitate formalization of the sector. The Programme works in eight countries (Burkina Faso, Colombia, Guyana, Indonesia, Kenya, Mongolia, Peru and the Philippines), and has a global knowledge management and communications component. UNEP, UNIDO and NRDC have been working on the main elements of the global project, including outreach to the investment sector, development of knowledge management tools and materials and a communications strategy, including the launch of the planetGOLD.org website. Other partners are participating as executing agencies for individual country projects. For example, the Artisanal Gold Council is executing the planetGOLD projects in Burkina Faso, Mongolia and the Philippines; Conservation International is executing planetGOLD Guyana, and UNDP is carrying out the projects in Colombia, Indonesia, Kenya, and Peru. Pact supported planetGOLD Indonesia assessment and capacity development of business and financial products in the ASGM sector. Pure Earth has supported with capacity building of government stakeholders in the ASGM sector and the empowerment of artisanal women miners in Indonesia, with building the financial capacity of miners and the development of modules for ASGM formalization. Also, Pure Earth in Colombia has developed a new Index Mercury Contamination methodology to prioritize the intervention of contaminated sites affecting vulnerable communities.
 - In June 2020, the GEF Council approved an expansion of the planetGOLD programme, adding eight countries: Bolivia, Ghana, Honduras, Madagascar, Nigeria, Republic of the Congo, Suriname, and Uganda. In June 2021, it was extended to an additional seven countries: Sierra Leone, Zambia, Mali, Guinea, Cote d'Ivoire, Nicaragua, Ecuador. The expanded programme will continue to focus on reducing the use of mercury, formalization, financial access, and responsible supply chains in the ASGM sector. It will also pilot jurisdictional approaches, which are place-based approaches to sustainability that focus on areas defined by (local) administrative boundaries, and that reconcile social, economic and environmental objectives through multi-stakeholder participation and government engagement. Some partners are involved in project preparation for this expansion.
 - The Government of Madagascar started the mobilization of stakeholders at national level for the elaboration of the Project Preparation Grant (PPG) submitted to the GEF in December 2021. Preparation of the other child projects is currently on-going.
- GEF-funded National Action Plans on artisanal and small-scale gold mining

UNEP has provided technical support to 30 countries developing National Action Plans on ASGM. Twelve of these have been completed. In addition to providing implementation support to individual country teams, UNEP also engaged in activities to benefit countries more broadly, including for example:

- Launching of the “Quick Start Guide for managing mercury trade in artisanal and small-scale gold mining”;
- Launching of the NAP specific gender guidelines “Incorporating gender dimensions into national strategy setting in chemicals management”;
- Using in house experts and utilizing peer review system, providing technical comments on the draft NAP documents; and providing “help desk” services and consultations on the development of NAP to participating countries.
- Organizing periodic webinars/regional meetings on specific aspects of NAP development/implementation and/or lessons learned.

UNIDO supported six countries in completing their National Action Plan projects and is still providing support to an additional seven countries.

- **Artisanal Gold Council (AGC)**

AGC has continued its work addressing ASGM in the core areas of policy, improved practices, finance, supply chain, and outreach. AGC continued to conduct research and development programmes on technical and training solutions for ASGM, including:

- The Executive Director Dr. Kevin Telmer signed a [Declaration of Responsibility and Sustainability Principles](#) along with other industry leaders at the LBMA/LPPM Global Precious Metals Conference.
- AGC also Completed the United States Department of State funded projects on “Increasing Transparency and Control of Mercury in Peru” (2018-2022) and “Abating Mercury Emissions via Mobile Processing Units for Small-Scale Gold Processing in Suriname” (2018-2022) (video [here](#)). The US DOS funded project “**Road Map to Responsible Gold**” began in Guyana to enhance existing national strategies to build a legal, professional, and mercury-free ASGM sector. A new project in Burkina Faso called **GOLD**, funded the SDC, was initiated to promote responsible gold mining at artisanal mining sites in Burkina Faso. It will be carried out for three (3) phases of four (4) years each for a total of twelve (12) years from 2023 to 2035. AGC’s work for the World Bank-funded project “**Supporting the Training and Capacity Building of ASGM miners in Burkina Faso**” which is wrapping up, focused on formalizing responsible gold supply chains and includes the improvement and scaling up of a sustainable and ongoing responsible gold trading social enterprise. As part of the dissemination plan, the project team will participate in a conference in Nairobi, Kenya under the theme “Business Unusual: What Future for ASM post-Covid-19?” Under a grant agreement with the Organization for American States in collaboration with the U.S. State Department, the AGC coordinated a webinar on “Hemispheric dialogue on the problem of the illicit importation of mercury for gold mining in the Americas: assessing the current situation in OAS’s Member States,” as well as a workshop titled “Regional workshops on irregular trade and storage of mercury for illegal mining: current risks and trends.”
- AGC is the executing agency for some of the projects under **the planetGOLD program**. In Burkina Faso, the Environmental and Social Impact assessment was completed and training of operators was undertaken in anticipation of the arrival of the mercury-free processing system (MFPS). The planetGOLD Mongolia and the Philippines projects held the second combined Regional Project Steering Committee meeting in Manila, including a site visit to the Paracale project in Camarines Norte province. In Mongolia, preparations are underway for the installation of the MFPS in two locations, and in the Philippines, technical construction of the MFPS is underway in one location, while in a second location, based on consultations with the community, a package of upgrades and technical assistance is being delivered. AGC also supports the **planetGOLD Global project** and staff recently attended [SOCAP Global](#), an impact investing conference, to educate investors about ASGM.

- **Alliance for Responsible Mining (ARM)**

ARM supported the following mining entities in the improvement of their processing methods:

- Coodmilla cooperative, Colombia: improving the gold recovery mechanism with innovative solutions such as Goldstrike©
- La Gabriela cooperative, Colombia: the organization switched to a gravimetric only processing plant, but also improved its yield.

- Mercury assessment in 4 mining areas in the Cauca area, Colombia. This led to the definition of actions plans to use mercury-free plants and start a decontamination plan in the most affected areas.
- The first free-mercury mobile processing plant in Colombia, located in Cauca.
- Cruz Pata cooperative, Peru, is using mercury on concentrates, and ARM supported the organization in defining an action plan towards mercury elimination in their process.
- ARM is supporting various other mining organizations in Colombia and Peru to achieve either access to legal market or Fairmined certification, and this support includes strategies to reduce the use of mercury, with the finality to eliminate completely its use.

ARM also implemented activities in the following projects/programs:

- Based on funding from WWF/FFEM, ARM started a viability assessment to select pilot sites in Guyana and Suriname as a first phase of a three-year project, which aims at contributing to reduce mercury contamination in the Guianas by phasing-out mercury use in the gold mining sector and reducing mercury emissions from mining deforestation by 2025.
- In Burkina Faso, preparation of the establishment of a “clean gold” supply chain, based on the pilot experiment, funded by CIEDEL in Zorgho and associated municipalities (Ganzourgou Province) that allowed the identification and test of alternative solutions to the use of mercury in mineral processing.
- In Burkina Faso, ARM is also executing the project “Sanu Kura: Support for the creation of responsible and legal gold mining in Burkina Faso”, aiming at the progressive formalization of 10 ASM sites and the elimination of mercury in 6 of them.
- ARM also contributed with a study on Burkina Faso to the IUCN report “Opening the black box: Local Insights into the formal and informal global mercury trade revealed”¹².
- **Appelglobal**, together with two other Danish companies (Elplatek and FLSchmidt), obtained a grant from the Danish Government to clean rivers draining small-scale gold mining communities from mercury. Appelglobal and partners have evaluated test sites for the cleaning operation in the Philippines and are presently evaluating test sites in South America.

AppelGlobal, in close collaboration with the Honduran Ministry of Environment and the GEF-Gold Program, completed a preliminary screening in June 2021 of forty-two geo-referenced sites along an 11-mile segment of the Sampile river and wetlands. Samples are presently being analysed for metallic and total mercury, together with pertinent ancillary parameters. Once the analytical results are available, a suitable site in the Sampile river will be identified to install a large machine for processing river sediments and mercury during the dry season. Recovered mercury will be shipped to Switzerland and stored in salt mines in Germany. The project will also train small-scale gold miners to extract gold without using mercury and will establish a scientifically rigorous baseline data platform to help the government and its partners measure development impacts from the project over time.

Appelglobal is about to finish a mission in Mauritania sponsored by the German government (GiZ); recently participated in educating small scale gold miners in Bolivia and in Uganda; and has started up a project in Honduras, sponsored by the Danish government, on cleaning tailings from small-scale gold mining and river sediments for mercury and introducing mercury-free gold extraction in Honduras.

- **ASSM Consult** with GEUS and funded by the PanAfgeo project, finalised a 4-day training in Maputo, Mozambique for 42 staff from National Geological Surveys in 16 countries in Southern African Region. The training provided new information as well as a forum for exchange of knowledge. Based on contributions from the participating countries a “ASM Handbook for Southern African Region” will be developed (<https://panafgeo.eurogeosurveys.org/>).
- **Association Institute of Total Environment (INTEV) (Cameroon)** exchanged information with several partners on the best approaches to create a proposal aiming to eliminate mercury in ASGM in Cameroon.
- **Carbone Guinée (member of the European Environmental Bureau / Zero Mercury Working Group (EEB/ZMWG))** conducted the following activities under a project part of the Small Grants Programme funded by the GEF:
 - Raising awareness among gold miners about the environmental and health risks associated with the use of mercury in gold mining, to support the adoption of good environmental and health practices.

¹² https://www.iucn.nl/files/groene_economie/Ir_mercury_brochure_digitaal_gebruik.pdf

- Training local craftsmen in the production of retorts and promoting them to enable gold miners use alternative methods and techniques.
 - Support to the acquisition of retorts.
 - Worked to make the SDGs more understandable in connection with the Minamata Convention (Article 7) and the Guinean mining code.
 - Making a documentary film on the testimony of gold miners and residents of the sites on operating conditions, the use of mercury and the risks to their health.
 - Capitalizing on knowledge, lessons learned from the project's approach and experience.
- **Cleangold:** In a pilot project funded by ConservationX Labs, El Centro de Innovación Tecnológica Minería y Medio Ambiente – (CITE Minería y Medio Ambiente) requested to test the products from Cleangold, an inexpensive gravimetric system designed to replace mercury and other toxins to recover finer gold than mercury. In Puerto Maldonado, Peru, CITE staff were trained remotely, and their results showed Cleangold outperformed mercury amalgamation and shaker tables.
 - **Cleangold:** In a pilot project funded by ConservationX Labs, El Centro de Innovación Tecnológica Minería y Medio Ambiente – (CITE Minería y Medio Ambiente) requested to test the products from Cleangold, an inexpensive gravimetric system designed to replace mercury and other toxins to recover finer gold than mercury. In Puerto Maldonado, Peru, CITE staff were trained remotely, and their results showed Cleangold outperformed mercury amalgamation and shaker tables.
 - **Diálogos** has several ongoing projects involving mercury-free ASGM, including:
 - Uganda (with Appelglobal) “Free Your Mine, 2018-2021”. UNACOH, NAPE. The project aims to train around 1000 small-scale miners in the mercury-free extraction method; to increase knowledge of mercury toxicology for local health care workers, teachers and school children; and to empower civil society stakeholders to support the miners in their transition to mercury-free mining techniques.
 - Mozambique “Artisanal Mining: Ambitions and culture in Cabo Delgado 2016-2020”. Medicus Mundi, Céntró de Vila. In March 2018 during a Diálogos’ miner-to-miner training session with scientific monitoring, the mercury-free method yielded up to 78 % more gold than the locally used method. In 2020, one mining community had gone totally mercury free using only borax to extract the gold.
 - Bolivia “Mercury Free Gold Mining (2020-2022)”. Plagbol. This project aims to train 300 ASGM miners, as well as 60 miners to act as trainers, in mercury-free method; increase knowledge of mercury toxicology for 20 health care workers and 50 teachers; and build capacity and empowerment of 50 civil society stakeholders, Miners' Unions with 900 cooperatives and the Ministry of Mining and Metallurgy to support the miners in their transition to the mercury-free method. Indirect beneficiaries will be 50,000 in the local population.
 - Tiira summit (planned 2021 but postponed due to COVID-19 pandemic). UNACOH, Busitema University, DASAM. A summit will be held with invited stakeholders from UNEP, Uganda Government, Dialogos etc. Presentation of miner-training in the mercury-free extraction method. There will also be a workshop at the University of Uganda on the prospects and challenges for promoting mercury-free extraction method to ASGM miners.
 - **European Environmental Bureau/Zero Mercury Working Group:** In the context of the ACP-MEAs programme of UNEP, EEB/ZMWG is working with the Uganda National Association of Community Occupational Health (UNACOH) and Women on Mining and Extractives (WoME), in Sierra Leone. UNACOH is strengthening the capacities of stakeholders in the ASGM sector to effectively reduce utilization of mercury in Amudat District and in Uganda generally, including installing two demonstration facilities for mercury free technology, training of trainers and education on toxicity of mercury. WoME, working in the Sierra Leone’s districts of Bo, Kono and Tonkolili, reached and trained 81 women miners on occupational health hazards of mercury use in artisanal mining and corresponding environmental hazards, using innovative environmental awareness raising activities using life-scene, area-specific artisanal mining and environmental degradation photos and videos suitable for audiences that cannot read. WoME also took the opportunity to interview participants to better target future work.
 - **Futura Jewelry** has worked on the following actions:
 - Futura participated in the charity event for “Have a Heart” that resulted in its event specific mercury-free gold jewellery being marketed to the 2 million followers of the on-line retailer Moda Operandi.

- Futura was chosen to provide content for a 6-minute news documentary produced by *Viewpoint with Dennis Quaid* on the issues of mercury emissions and gold mining. As of October 10th, 2022, the documentary is live on the top 100 US public television stations and will be aired for the next year.
- Futura's jewelry made with gold from certified artisanal small-scale mines with clean, mercury-free mining practices expanded its distribution.
- Futura's website as well as social media activity provide information that supports the work of the Partnership. Futura enlists the support of social media influencers to grow the reach of its responsible gold message; participates in podcasts that help communicate the message on the elimination of mercury emissions in small scale gold mining and educates the public; and appeared on jewelry webinars devoted to the need for better practices in the sector.
- **Transforming Natural Resources Management (IMPACT)** implemented a number of projects and activities to contribute to the elimination of the worst practices and support innovative market-based approaches:
 - IMPACT documented its learnings from the Just Gold project in north-eastern Democratic Republic of the Congo (DRC), funded by Global Affairs Canada, in the report "The Just Gold Project: Lessons for the Future of Artisanal Gold in Democratic Republic of Congo" in March 2021. The report documents the lessons learned throughout the implementation of the project, including the provision of technical assistance to miners, and identifies critical barriers for the future of conflict-free, responsible artisanal gold in the DRC. IMPACT is now working with various stakeholders in DRC to address these barriers, most notably on reforming the fiscal regime for the artisanal gold sector which, in its current form, serves as a disincentive for legal trade and threatens the commercial viability of conflict-free, responsible artisanal gold supply chains.
 - Continued implementation of the Just Gold project in Côte d'Ivoire with funding from the European Union. The project had regular exports of legal and traceable artisanal gold from the cooperative to a European refiner, while providing technical assistance to miners including the installation of mercury free gold processing equipment.
 - IMPACT began implementation of the Gender Equality and Women's Empowerment in Artisanal Mining project, known as the Digging for Equality, funded by Global Affairs Canada. The project is implemented in DRC, Uganda and Zimbabwe over a three-year period and supports women miners to improve their environmental practices. The project supports installation of gravimetric mercury free processing in South Kivu, DRC. Environmental Assessments and strategies for reducing mercury exposure amongst women miners have been developed.
 - IMPACT began a new project in partnership with the Colorado School of Mines and I.R. Consilium entitled "Understanding and Disrupting Key Convergence Nodes of the Illicit Gold and Mercury Supply Chains in Latin America and Africa". The project will contribute to a better understanding of illicit supply chains and the ability to detect, disrupt, and disable them through an examination and comparison of key convergence nodes in the global supply chains for illicit gold and mercury in Latin America and Africa, with a focus on Peru and Kenya. The 5-year project is funded by the National Science Foundation.
 - With the support of Global Affairs Canada, IMPACT developed and launched a Gender Impact Assessment Toolkit for Projects and Policies Related to ASM in December 2020. This is the first gender impact assessment tailored to the sector and which can be used by policymakers or project developers, including those implementing projects to reduce mercury use. The toolkit is currently in use by IMPACT's partners in DRC, Zimbabwe and Uganda. It is available in Spanish, English, and French.
 - IMPACT launched its Foundations for Peace project in Burkina Faso, which aims to support a more responsible artisanal gold sector, while increasing security in mining communities.
 - Continued development and digitization of IMPACT's Planning, Monitoring and Learning System for impact monitoring, to improve understanding of interventions on formalisation, mercury reduction, traceable supply chains, and due diligence initiatives.
- **Marcello Veiga (Professor Emeritus University of British Columbia)**. In 2021-2022, professor Veiga participated in several projects on ASGM:
 - Chief Technical Advisor of projects implemented by Solidaridad in Pamaka, Suriname. One project aimed at improving techniques used by Artisanal Gold Miners through training of 200-300 people in chemical analyses, mineral processing, and elimination of mercury from operations. The other aimed at developing strategies to reduce environmental impacts, improve

- quality of life of miners and their communities, and introduce reclamation measures and economic diversification of 200 artisanal gold miners and their families.
 - Carried out a number of trainings on ASGM during the past year including a training in Suriname for artisanal miners and people from a large-scale operation (followed by Gold Metallurgical balance of 30 artisanal mining operations); to three universities in Peru (Univ. Católica santa Maria, Univ. Católica San Pablo and National university of San Agustinand online to a network of Artisanal Miners in the Brazilian Amazon and in Peru.
 - Technical assistance to small companies processing gold from tailings in Sudan and in Costa Rica.
 - Participation in projects aimed at training trainers, miners and Government employees on Artisanal Gold Mining in Mauritania, Colombia and Indonesia.
 - Participation in a project of assessment of coexistence of Artisanal Miners with Conventional Mining Companies in Brazil, implemented by EGPS – World Bank.
 - Starting a project of installing a new processing plant for ASGM in Colombia.
- **McGill University, Montreal, Canada**, in collaboration with Ghana Health Service, published new research to demonstrate that mercury exposures are about 3-fold higher in ASGM miners working in un-registered sites versus those working in registered sites in Tarkwa, a gold mining town in Ghana. The study compares mercury exposures and neuropsychological test results between miners from registered and unregistered ASGM sites. The research also found that ~30% of artisanal miners indicated some degree of associated health challenges in relation to reduction in appetite, hair loss or excess salivation.
 - **Pact's Mines to Market** programme has undertaken the following activities in support of ASGM's sustainable transformation:
 - In Sierra Leone, a Pact project funded by GiZ has recently helped to establish the country's first formalized ASGM association: the Bolaneh Gold Miners and Traders Association (BMTA). In addition, Pact partnered with mining equipment fabricators in Freetown to design, fabricate, install, and trial a mercury-free mineral processing plant, which was successfully demonstrated with BMTA. Pact also organized several recent trainings on topics of ASGM formalization, gold trade, environmental management, and Occupational Health and Safety (OHS).
 - In Mali, Pact's project "Promoting a Mercury-free Mali" (funded by U.S. Department of State) has delivered a number of trainings and provided support to registered ASGM association "Dje Kabara". In addition, Pact recently hosted a national workshop in Bamako on promoting formal gold trade.
 - In Mauritania, on a project funded by EPRM, Pact and its local partner Magma Group have organized the country's first workshop on formal gold trade and supply chain due diligence, which included mercury-free mineral processing equipment demonstrations in Magma's demonstration site. Pact and Magma have also conducted field research in Inchiri province to map the gold supply chain and engage ASGM miners.
 - In Ghana, with funding from U.S. Department of State, Pact along with local partner Solidaridad have continued to support (6) selected small-scale mining companies to undertake detailed mine site assessments regarding mineral processing, in anticipation of the selection, purchase and installation of mercury-free equipment installations, planned for early 2023. In August 2022, Pact and Solidaridad hosted a "Shark Tank" style event in Tarkwa, which was attended by miners, and local ASGM stakeholders including government representatives. Mine operators were supported by the project to present their Mine Plans, to pitch for further support and investment.
 - In Colombia, Pact has continued long standing relationship working with US Department of Labor / ILAB, on a project called Pilares, which focuses on building the capacity of civil society to combat child labor and improve working conditions. In a separate project with USAID called SCIOA, Pact is strengthening the capacity of indigenous peoples' organizations in the Amazon (Brazil, Colombia, Ecuador, Peru, and Suriname).
 - In Zimbabwe, 2020/2021 Pact and UNDP partnered to support the establishment of a mercury-free mineral processing plant at Umbrella Mine in Makaha, including training miners on its operationalization.
 - With funding from PlanetGOLD, Pact has collaborated with NRDC and the International Cyanide Management Institute, and others - to produce a Guidance document on *Best Management Practices for Cyanide Use in the Small-Scale Gold Mining Sector*. The guidance is directed at policymakers, ASGM practitioners, and SSM professionals.

- At the global level, Pact has established and coordinated a COVID-19 working group through its Delve platform with the World Bank, which has included coordination of assessments on COVID-19 impacts on ASGM communities in Colombia, Kenya, Nigeria and Myanmar.
- Pact developed and partnered with the University of Delaware to publish a comprehensive Policy Assessment concerning ASM's contributions to the SDGs (de Haan, Jordan; Dales, Kirsten; and McQuilken, James. 2020. Mapping Artisanal and Small-Scale Mining to the Sustainable Development Goals).
- **Population and Development Initiative (PDI, Tanzania)**, supported by Responsible Mining Foundation and Innovation for Change Africa Hub, conducted dialogue sessions on promoting responsible mining among ASGM in Geita district in Tanzania. PDI also visited Nyarugusu and Lwamgasa Mining sites in Geita district. Using the Mine Site Assessment Tool (MSAT), PDI led constructive dialogues on issues of tailings, community complaints mechanisms, and water quality among other topics, which included small miners, mining associations, mining companies, community members, village government and CSOs. The discussions led to the agreement that small scale miners and CSOs will increase participation in the implementation of the national action plan to reduce the use of mercury among gold mining communities in Tanzania.
- **Pure Earth** is currently working in Peru, Colombia and Indonesia on projects addressing mercury pollution associated with artisanal gold mining.
 - In Peru, Pure Earth has been working since 2019 with small-scale miners in Madre de Dios to reduce mercury-use and promote ecological mine closures. With the Center for Amazonian Scientific Innovation (CINCIAS), Pure Earth holds training for miners in restoration and has reforested 8.5 hectares of degraded land. Pure Earth also works with CITE Minería y Medio Ambiente, a Peruvian institution dedicated to cleaner mining technologies, to study local ore characteristics and train miners in the use of shaking tables.
 - In Colombia, Pure Earth has actively contributed to various projects with different approaches, but which are complementary, achieving a comprehensive management of ASGM operations. (1) Under funding from the United States Department of State a technical protocol was developed for the management of mercury-contaminated tailings and an economically viable technique to recover mercury from tailings using silver-plated copper plates. The protocol is intended for use by the government and stakeholders in Colombia and globally. (2) The Pure Earth team also contributed to the implementation of planetGOLD through UNDP. Colombia office investigated 30 contaminated sites and 35 tailings piles in Colombia and developed a mercury contamination index that quantifies and ranks the health risks of a contaminated site using environmental samples and population demographics to help prioritize interventions. Also, in the treatment of 90 tons for the recovery of mercury and gold, adding complementary techniques to silver-plated copper plates. (3) With funds from the national government through the Ministry of Mines, the characterization of 140 tailings in 8 departments is completed.
 - In Indonesia, Pure Earth contributed to the implementation of planetGOLD projects relating to an improved policy/regulatory framework for mercury-free ASGM, financing for mercury-free processing equipment and capacity building for mercury-free ASGM. In collaboration with the Pact Institute, the team completed assessment and capacity development of businesses and financial products in the ASGM sector. In collaboration with Yayasan Tambuhak Sinta (YTS), the team completed capacity building of government entities and stakeholders in the ASGM sector, as well as projects to empower artisanal women miners to eliminate mercury use and establish a women miners cooperative in the only alluvial mining site of planetGOLD's six project sites in Indonesia, i.e., Kuantan Singingi, Riau. Pure Earth also teamed up with YTS to write six modules relating to ASGM formalization, comprising: (1) Procedures for Establishing Cooperatives and Village-Owned Enterprises in ASGM Sector; (2) Leadership in ASGM Sector; (3) Procedures for Obtaining ASGM People's Rights; (4) Procedures for Applying for Permits and Operating Processing Facilities; (5) Mineral Processing and Waste Management in ASGM Sector; and (6) Technical Rules for Community Mining Permit. Training of trainers (ToT) on ASGM formalization has been conducted in four project sites throughout 2021 and were conducted in one project site in 2022.
- **Satoshi Murao (Professor, Daiichi Institute of Technology)**, continued work addressing ASGM in the core areas of science, technology, improved practices, supply chain, and outreach. For example, his team found that water-soluble mercury is increased in concentration after forest fire in ASGM areas (Takenaka et al., in print).
 - Contributed with scientific and technological information to the development of the document: "Sound Tailings Management in Artisanal and Small-Scale Gold Mining – Technical Document (UNEP, 2021)".

- Initiated in April 2021, with Waseda University, a three-year project “Interdisciplinary Research on Mercury Pollution by the ASGM, Using the Varved Lacustrine Sediments” to understand long distance mercury transported from ASGM sites. The project is funded by the Japan Society for the Promotion of Science and will study lake sediments in the Philippines and Indonesia as well as a historic ASGM site in Japan.
 - In November 2021, a webinar entitled “Geological and Environmental Research Methodologies for ASGM ” Present Status of Observation and Monitoring Technology Towards Risk Management of Mercury” was jointly held by GMP and the Japanese Society of Geo-Pollution Science, Medical Geology and Urban Geology.
 - Worked with the Ministry of the Environment, Japan, mainly through its series of international ASGM webinars to share Japan’s experience and knowledge on mercury and presented in Indonesia and Myanmar.
 - Analyzed a core drilling from a tailings dam geological properties and for residual gold and mercury. A meeting was convened with local municipalities, companies and local residents to discuss risk management ideas for the material.
 - Hosted meetings and trainings on mercury and ASGM, including a lecture on ASGM issues delivered to African students studying in Japan and an interdisciplinary and international event “Mercury Legacy in Artisanal and Small-Scale Gold Mining”.
 - Based on Prof Murao’s information, the Yomiuri (a nation-wide newspaper in Japan) published an article on ethical jewelry as a solution of the ASGM issues.
 - Several papers were published including the following: Prof Masaaki Fuse at Hiroshima University developed a data-driven approach to detect the existence of illegal intercountry mercury trade by focusing on discrepancies in each country's trade statistics¹³. Dr. Kenichi Nakajima developed a new method examining global mercury use inconsistencies based on estimating and comparing the mercury input of ASGM activities to the total mercury available domestically¹⁴ ; Dr Nakajima also investigated mercury mitigation effects and unintended consequences (need for retorted mercury management and cyanide emissions) of intervention strategies in ASGM by 2050.¹⁵
- **Solidaridad Guyane and Minamata Disease Research Institute** collaborated on a mercury intoxication project in the French Department of Guyane and provided the population with information on the type of fish they should focus their diet on.
 - **Sustainable Alluvial Mining Services (SAMS)**
 - Esa'ala ASGM pilot project in Papua New Guinea initiated by a local government authority to achieve sustainable rural development driven by revenue generated from responsible ASGM activities. The first phase (out of four) of the project included the organization of local miners into legal mining entities and the establishment of ASGM desks. So far, registrations include two Small Scale Mining Associations, an ASGM desk created at the district level and a female small-scale Mining Association;
 - SAMS Technical experts based in Australia have also created a simple gold recovering equipment, which eliminates almost entirely the risk of spillage or loss, the risk of inhaling mercury vapour, and the risk of environmental contamination;
 - SAMS also collaborated across areas by leading the Working Group on Capacity Building and Awareness Raising under the Waste Management Area, developing workplans and programs for specific areas including ASGM.
 - SAMS has also started dialogue on introducing a Small-Scale Mining Bill in the Papua New Guinea (PNG) Parliament to get a specific Act enacted for the ASGM sector. They have developed working papers and draft policies and are currently in dialogue with lawyers to help draft the bill.
 - **Universidade Federal do Pará (UFPA), Belém, Brazil:** The Molecular Pharmacology Lab of UFPA, located in the Brazilian Amazon, carried out actions aiming the following goals:
 - Understand state-of-art of mercury impact in the Amazon region: a scoping review evaluating data on neurological consequences of human exposure to mercury in the Amazon, with critical insights and recommendations, was performed to improve future epidemiological surveys and prevention strategies¹⁶ .

¹³ Fuse, M. et al. (2022), Environmental Science & Technology, 56(19), 13565-13572; DOI: 10.1021/acs.est.2c04327

¹⁴ Cheng, Y. et al. (2022), Resources, Conservation and Recycling, 185, 106461; DOI: 10.1016/j.resconrec.2022.106461

¹⁵ Kosai S. et al. (2022), Resources, Conservation and Recycling, 188, 106708; DOI: 10.1016/j.resconrec.2022.106708

¹⁶ Ecotox. Environ. Saf. 208, 111686; doi: 10.1016/j.ecoenv.2020.111686

- Performed basic research on toxicology related to comparing experimental to real-world human exposures¹⁷ as well provided new understanding of the neurotoxicity of environmental pollutants including mercury¹⁸.
- In collaboration with the *Clínica de Direitos Humanos e Direito Ambiental e Mestrado em Direito Ambiental*, University of the State of Amazonas (also Partner of the UNEP-GMP) and other institutions, wrote a national bill for the implementation of a national system for monitoring mercury exposure cases in Brazil, which was presented at a public hearing in September 2022¹⁹, supported the Federal Public Ministry of Brazil, in Macapá (capital of the State of Amapá) and is scheduled for a public presentation in Brasília next year, with the support of two federal senators.
- Launched a course titled “Development of research with vulnerable populations” for PhD students at Federal University of Pará that will be also used for training health professionals, increasing the number of future researchers and health professionals interested in understanding the impacts of mercury in vulnerable populations living in Brazilian Amazon.
- Contributed to the international discussion about the future consequences and studies in the Amazon: a comprehensive review alerting about the most recent events that amplifies ASGM impact in the Amazon was published in the journal *Environment International*²⁰. Also, the combination of salivary markers and neuropsychological tests was discussed and proposed as accurate, non-invasive, and low-cost strategies for evaluating vulnerable populations²¹.
- Divulged information and provide support to judicial and legislative decisions to reduce ASGM impact in the Amazon: elaborated an *Amicus Curiae* for the Supreme Court of Brazil explaining the dangers of the Roraima State law on ASGM activities in protected lands, in collaboration with the Universidade Estadual do Amazonas and the Pontifícia Universidade Católica do Paraná. This *Amicus* was accepted by the Court and supported its final decision against the law. Also, participated in the public hearing to decide whether ASGM activities would be allowed in the Tucuruí region (State of Pará), providing epidemiological data that demonstrated human exposure to mercury.
- Increased technical expertise and qualified human resources in the Amazon: led the creation and implementation of the first PhD program in toxicology and biochemistry in the Brazilian Amazon including specific research projects on mercury and ASGM impacts that will allow reinforce the healthcare system and the technical capacity to deal with the problem “*in loco*”.
- Developed proposals for nudge interventions, tailored to the characteristics of the Amazonian remote/isolated populations affected by ASGM²².
- **University of British Columbia, Vancouver, Canada.** Activities included:
 - Part of the Consultant Group studying for the Government of Ghana the feasibility of implementing a Training Center for Artisanal Miners in Tarkwa and produced a report which encompasses design of the center, list of equipment, suggestions of sources of income, strategy of teaching, personnel, business plan, cashflow, etc.
 - Laboratory studies of unconventional methods to extract gold from gravity and flotation concentrates using bitter cassava, simplified cyanidation and organic extraction (no water). Results are very promising ranging from over 50% to 100% extraction. Students are searching for bitter cassavas with higher levels of glycosides in the Amazon.
 - Elaboration of an extensive review article on Gravity Concentration Methods in Artisanal Gold Mining explaining the pros and cons of each procedure.
 - Elaboration of detailed inventory of coexistence of Artisanal Gold Mining (AGM) and Conventional Gold Mining (CGM) companies.
 - Elaboration of a list of problems faced by many projects when trying to eliminate the use of mercury in AGM, published at: Veiga, M.M. and Fadina, O. (2020). A review of the failed attempts to curb mercury use at artisanal gold mining and a proposed solution. *Extrac. Ind. Soc.* 7, 1135-1146.
 - Consulting for UNDP Indonesia and the Government of Indonesia on methods to eliminate mercury in AGM.
 - Classes to the Association of Small-scale miners of Peru on mercury-free methods to extract gold.

¹⁷ See *Food Chem. Toxicol.* (2022) 166: 113210, doi: 10.1016/j.fct.2022.113210

¹⁸ doi: 10.1007/s12035-021-02420-y) (doi: 10.1016/bs.ant.2022.04.003

¹⁹ <https://portal.ufpa.br/index.php/ultimas-noticias/13892-ufpa-participa-da-criacao-de-projeto-de-lei-que-visa-a-prevencao-a-exposicao-e-intoxicacao-mercurial-na-amazonia>; <https://www.youtube.com/watch?v=qCXn-IR7qK0>

²⁰ doi: 10.1016/j.envint.2020.106223

²¹ *Environ. Res.* 200, 111432; doi: 10.1016/j.envres.2021.111432

²² *Foods* 10, 1015; doi: 10.3390/foods10051015

- Elaboration of a study on the legislations related to AGM in the 9 Amazonian countries. This is pointing out the hurdles to formalize AGM.
- University of Illinois at Chicago, Great Lakes Center for Occupational and Environmental Health
 - Developed a curriculum for primary healthcare providers on mercury poisoning and other adverse health effects related to ASGM, which is available on the Partnership website²³.
 - Currently working on a biosensor system for mercury testing in biological fluids that will hopefully become a point-of-care test in 1 to 2 years.
- Zuleica Castilhos and the Environmental Speciation Mercury Laboratory (LEMA - CETEM) in Brazil undertook a variety of scientific and policy activities related to mercury and ASGM, including:
 - Analysing nearly 1000 Amazon fish samples for mercury; delivering a short course on the Minamata Convention and practical implications for small gold mining in Brazil, where the toxicology and biogeochemistry of mercury, and effects on health as well as analytical limitations and consequent environmental monitoring strategies for the Brazilian Amazon was discussed to support the actions of the Human Rights Clinic in the Northern region of the country,
 - Participating in the International Conference on Mercury as a Global Pollutant with four papers: “Gold Certification and Sustainability in Brazilian Artisanal and Small Scale Gold Mining”; “A picture of Artisanal and Small Scale Gold Mining (ASGM) in Brazil and its Mercury emission and releases”; “Mercury in Amazonian fish at a glance” and “Control procedures and traceability of analytical results of mercury quantification: a case study of the Environmental Mercury Speciation Laboratory – Brazil”;
 - Delivering lectures to WWF and Brazilian lawyers on ASGM, environmental contamination by mercury and health rights in Brazilian Amazon Region; to the 3rd Mining Seminar of the North of Mato Grosso State on Fairmined and Gold Production Certification and Women in Mining: Opportunities and Challenges’ and the Congress of the Latin American Network of Legal Anthropology on Brazilian Amazon ASGM: from the traditional concept to the complex local reality.
- c) Planned future activities include:
 - As some countries are finalizing the development of their NAPs, the Partnership area will focus on activities that support implementation of these plans, as well as continue to support sharing of NAP experience among governments, including through the planetGOLD programme and numerous bilateral activities.
 - The Partnership area has had some success attracting more private sector partners and will continue to foster their greater collaboration and engagement.
 - The Partnership area will continue to act as a critical information-sharing mechanism amongst Parties to the Convention.

2) Mercury cell chlor-alkali production

- a) The objectives of the Partnership area are to:
 - Prevent the construction of new mercury-cell chlor-alkali production facilities;
 - Reduce mercury emissions and use from existing mercury-cell facilities;
 - Encourage conversion to non-mercury processes;
 - Reduce or eliminate mercury releases from waste generated by chlor-alkali production facilities including waste from conversion to non-mercury processes; and
 - Promote environmentally sound options for storage of surplus mercury to limit downstream releases from surplus mercury generated by the conversion, phase-out, or closure of mercury-cell chlor-alkali facilities.
- b) Key activities in the Partnership area are presented below.
 - UNEP and Mexico’s Secretariat of Environment and Natural Resources (SEMARNAT), and CYDSA, S.A de C.V (private sector) continue to refine final details of a potential GEF-funded project to convert/decommission two remaining mercury cell chlor-alkali facilities in Mexico,

²³ <https://www.unep.org/globalmercurypartnership/resources/tool/artisanal-and-small-scale-gold-mining-curriculum-health-sector>

including plans for the management of mercury waste and contaminated sites related to the two facilities. GEF approved the project in June 2020. Project development has experienced some delays due to COVID-19.

- ABICLOR and CLOROSUR, on behalf of the chlor-alkali Partnership area, have been coordinating efforts to assist the remaining four chlor-alkali plants in Brazil to phase-out mercury from their operations. These efforts have included facilitating the search of funds for both replacement with membrane facilities and treatment, as well as stabilization and disposal (storage) of the mercury wastes. COVID-19 has complicated project financing, delaying further development of the project.
- The Partnership area participated in a contaminated sites workshop hosted by Mexico's Instituto para la Protección Ambiental de Nuevo León where they presented on topics related to the managing mercury contaminated sites in the chlor-alkali sector.
- The Partnership area held its annual meeting in February 2022, amongst others to consider the Business Plan, update on Partnership area activities, and identify Partnership area priorities for 2022.²⁴

c) Planned future activities include:

- Reviewing and updating the chlor-alkali business plan for 2022 to reflect the current global landscape as it relates to the chlor-alkali sector;
- The Partnership areas on mercury cell chlor-alkali production and on mercury waste management are considering hosting joint webinars to address the needs and challenges faced by chlor-alkali producers both for financing of the conversion process and for addressing the management and disposal of mercury wastes;
- Continuing to collect more information from countries on ongoing and potential conversion projects;
- Providing technology advice for potential chlor-alkali conversions;
- Facilitating the acquisition of financing for promising potential conversion projects;
- Increasing focus on collecting and sharing current knowledge and best practices in the management and disposal of stocks for converted facilities, for example by increasing cross-partnership collaboration, especially with the Partnership areas on mercury supply and storage and on mercury waste management.

3) Mercury air transport and fate research

- a) The main objective of the Partnership area is to increase global understanding of international mercury emissions sources, fate and transport, by:
- Accelerating the development of sound scientific information to address uncertainties and data gaps in global mercury cycling and its patterns (e.g., emission sources, air concentrations and deposition rates, source-receptor relationships, hemispheric-global air transport/transformation, mercury in biota and spatial and temporal variations driven by ecosystem sensitivity);
 - Enhancing compilation and sharing of such information among scientists as well as between them and policy makers.

The specific objectives are:

- To support the implementation of the Minamata Convention and the development of a globally coordinated database and monitoring system for measuring mercury levels in air, marine and terrestrial ecosystem, which may contribute to assess the effectiveness of measures taken;
- To assist relevant stakeholders involved, including Parties to implement the necessary actions to fulfil the requirements of the Convention and its objectives;
- To gather up-to-date information on mercury contamination worldwide and support capacity building activities to transfer knowledge on mercury monitoring and best practices to all relevant stakeholders involved;
- To facilitate the dialogue between the scientific community, policy makers and other relevant stakeholders.

b) Key activities in the Partnership area include:

²⁴ <https://www.unep.org/globalmercurypartnership/events/unep-event/partnership-area-mercury-cell-chlor-alkali-production-2022-meeting>

To support the preparation of the Mercury Monitoring Guidance Document for COP4 (activities led by BRI):

- Support the generation of Chapter 6 (on biota mercury) of the Mercury Monitoring Guidance Document in preparation for COP4 and assist with other Chapters as requested by the Secretariat of the Minamata Convention. The Global Biotic Mercury Synthesis (GBMS) is a data basis for this report.
- Support by Partnership area members as expert reviewers for Chapter 6.

To support countries and intergovernmental organizations to improve mercury assessment and monitoring capabilities (activities led by BRI):

- Coordinate and assist countries with their Minamata Initial Assessments (MIAs) - 26 out of 37 have been completed.
- Review completed MIAs under contract with UNEP, before their onward submission to the Secretariat of the Minamata Convention and provide feedback to the Implementing Agencies and focal points of the Country.
- Develop country projects where the use of skin-lightening products is reduced and their sale and import in line with obligations of the Minamata Convention in coordination with the Partnership area on mercury in products. One GEF project is being implemented with UNEP as the implementing agency and WHO as a co-executing agency with BRI;
- Assist with the initiation of regional networks in the context of projects supported by the Specific International Programme, such as the Caribbean Region Mercury Monitoring Network – overseen by Antigua and Barbuda and potentially others in central Africa and southern Asia;
- Provide add-on value support to countries that may want to initiate preliminary mercury monitoring efforts with Passive Air Samplers, biota and human biomonitoring;
- Generate communication pieces to enhance the understanding of policymakers of scientific findings, on topics such as mercury monitoring of air, biota, humans and certain products.

To facilitate the dialogue between the Partnership area and on-going programmes such as GEO Flagship on “Global Observation System for Mercury - GOS4M” (activities led by CNR):

- Increase the availability and quality of Earth Observation data and information to contribute to the tracking of mercury released to the global environment and, where appropriate, anticipate changes to the environment;
- Harmonize metadata production, archiving and sharing data from existing mercury monitoring networks; and develop advanced services (e.g., access to air mercury monitoring data) in support of policy mandate through the Minamata Convention;
- Develop automated robotic systems for monitoring Hg, among other parameters, in air, topsoil and top-water microlayer to better understand the cycle of this pollutant at the air-water/topsoil interfaces;
- Facilitate cooperation of governments and institutions tracking persistent pollutants;
- Foster the adoption of advanced sensors in monitoring mercury and its compounds;
- Prepare, archive and share metadata.

To promote continuous studies on mercury contamination in air and marine compartments with reference to several ad-hoc field campaigns organized and carried out in different parts of the world (activities led by CNR):

- In this framework, the I-SEED project²⁵ FET PROACT-EIC-08-2020 Environmental Intelligence Research and Innovation Action - Grant Agreement n. 101017940) is aimed to develop robotic system made with biodegradable materials able to provide continuous monitoring data of Hg, CO₂, RH and T in air and topsoil. The project is part of GOS4M and is aimed to support the goal of the MCM and its global monitoring plan implementation.
- ERA-PLANET is an ERA-NET Co-funded action under the EU H2020, started in 2016 and ended in January 2022, as part of the Group on Earth Observations (GEO) and Copernicus (www.copernicus.eu). A final project meeting was held in October 2021 to present major outcomes to stakeholders and policy makers.

²⁵ <https://iseedproject.eu>

- Within ERA-PLANET programme, the projects iGOSP²⁶ and iCUPE²⁷ have been developed and are under implementation. Within iGOSP a fully interoperable knowledge hub²⁸ was developed to better understand the dynamic processes affecting the fate of mercury emissions to the atmosphere to ecosystems and leaving organisms and ultimately its impact on human health²⁹. This platform built-in GOS4M Knowledge Hub will make available all mercury data gathered from ongoing mercury monitoring programmes.

To develop a global web-based platform for existing and new mercury data (activities led by BRI):

- The overarching goal of this project is to provide contributions toward advancing guidance on monitoring data and harmonized, comparable information on mercury concentrations in the environment, which may support the effectiveness evaluation discussions under the Minamata Convention;
- Project objectives are to: (1) Establish a Science-Policy Advisory Panel to guide the project, support quality control, and facilitate outreach, while working through the Partnership area with member participation; (2) Assess web-based Global Knowledge Platforms that best fulfil the needs of Parties and associated stakeholders of the Minamata Convention; (3) Generate a centralized database for existing mercury concentrations in biota (based on GBMS); (4) Identify a suite of queries collated from Parties and other stakeholders of the Minamata Convention; (5) Work with data providers, information technology experts, end-users, and other stakeholders to design and develop a functional online platform that meets identified interests; (6) Conduct testing of the platform capabilities, including data acquisition, data ingestion, data quality control, information synthesis, data query, and data visualization and implement any needed improvements based on the testing, leading to the development of a final version of the knowledge platform. Approvals and consultations are still pending with GEF-STAP and UNEP.
- Consultations with the Minamata Secretariat are expected.

Passive air sampling for mercury on a global scale. Activities included and led by Environment and Climate Change Canada (ECCC):

- ECCC is leading a global passive air pilot study for the collection of atmospheric mercury concentrations. The intent of this study is to assess the feasibility and comparability of new sampling technology on a global scale in conjunction with currently deployed active and passive mercury sampling investigations by other research/monitoring groups. This project is employing the MerPAS® sampler produced by Tekran Instruments Corp. This technique collects gas phase mercury on a sulfur-impregnated activated carbon sorbent. The samplers are shipped to site locations and are deployed for 3-month time periods. Following deployment, they are shipped back to the laboratory at ECCC for analysis. Results from this study will be openly available to the public and housed on the ECCC Open Data Portal.
- While considerable mercury monitoring in the atmosphere has taken place in the past two decades, there remain many regions where there is little to no information. The intent of this study is to attempt to fill the gaps in monitoring information by collaborating with currently operating air monitoring networks to initiate or continue atmospheric mercury monitoring using this passive sampling technology. The intent is not to create new networks in various regions but to use the current facilities and infrastructures that exist to add this type of sampling. In essence, creating a “global network of networks”. The current networks that we have partnered with and deployed samples to include the Environment and Climate Change Canada Arctic Network, the Global Atmospheric Passive Sampling (GAPS) network, the Asia Pacific Mercury Monitoring Network (APMMN), and the National Atmospheric Deposition Network (NADP). In the future, other known networks will be approached to explore possible partnership, including the Caribbean Mercury Monitoring Network (CMMN), the Latin American Passive Air Sampling Network (LAPAN), the Global Mercury Observation System network (GMOS), the RECETOX driven Monitoring NETWORK (MONET) programme in Africa, the European Monitoring and Evaluation Programme (EMEP) and the Arctic Monitoring and Assessment Programme (AMAP). To date, we have partners with 55 sites around the world in 28 countries and deployed 285 samplers.

²⁶ www.igosp.eu

²⁷ www.atm.helsinki.fi/icupe

²⁸ GOS4M KH, www.gos4m.org

²⁹ De Simone et al. 2021a, b – in Env. Sci. & Policy

- c) Planned future activities are as follows:
- Partners of the Partnership area are working on projects that can contribute specifically to Articles 1, 19 and 22 of the Minamata Convention but are not limited to these Articles. Such activities include the development of data collection and synthesis, field assessments, and the development of mercury monitoring networks that can contribute toward a global understanding of mercury, as well as towards discussions on effectiveness evaluation under the Mercury Convention.
 - Efforts are particularly well established for air mercury data collection and monitoring through the GOS4M Flagship of the Group on Earth Observations and biota mercury monitoring based on the Global Biotic Mercury Synthesis (GBMS) database that will be published and also made available through a web-based interactive platform. GBMS is the only database that synthesizes over 1,400 peer-reviewed publications about mercury in biota that contributes to nearly 800,000 mercury data points for taxa identified in Article 19 (e.g., fish, sea turtles, birds and marine mammals).
 - The newly established Caribbean Mercury Monitoring Network could be an example of regional network that members of the Partnership area could develop, especially in areas that have been identified with major data gaps yet have identified or projected elevated environmental mercury loads that may infringe on ecological and human health.
 - The Partnership area, through BRL, is also exploring cooperation with the academic sector through a research project aimed at the identification and spatiotemporal visualisation of the impacts of mercury contamination (threat) on the environment and human health through a characterisation of ecosystem sensitivity and risks contamination of biota. The project would comprise in-depth field investigations and sampling, in Gabon and potentially Cameroon, to enable data production and analysis for the development of an interactive database and communication tool, supporting informed decision-making to implement the Minamata Convention.

4) Mercury in products

- a) The objectives of the Partnership area are to phase-out and eventually eliminate mercury in products and to eliminate releases during manufacturing and other industrial processes via environmentally sound production, transportation, storage, and disposal processes.
- b) Key activities in the Partnership area include:
- **Report on the Harmonized Commodity Description and Coding System:** COP-3 Decision MC-3/3 directed the Partnership area, as well as relevant experts, to draft a guidance document for consideration at COP 4 on the use of customs codes for monitoring the import and export of mercury-added products, including: (1) for the mercury-added products listed in Annex A to the Convention, a list of possible customs nomenclature codes of more than six digits that could be used by Parties; (2) for mercury-added products not listed in Annex A to the Convention, a compilation of examples provided by national experts of customs nomenclature codes of more than six digits currently in use by Parties; (3) examples of good practice where the use of customs nomenclature codes at the national level has been supplemented by the use of other control tools for the purpose of implementing trade provisions, such as those found in Article 4 to the Convention.; and (4) an assessment of whether the subsequent development of six-digit harmonized codes would be a useful complement to codes of more than six digits. That decision also requested the Secretariat of the Minamata Convention to circulate an open call to all Parties, non-Parties and other stakeholders, including relevant organizations, to identify experts familiar with the use of national customs codes to participate in the open-ended process.

A draft guidance document (UNEP/MC/COP.4/27) and an information document (UNEP/MC/COP.4/INF/5) on the use of more mercury-specific customs codes have been developed as requested at COP3. This guidance describes the use of customs codes for monitoring and controlling the import and export of mercury-added products pursuant to Article 4 of the Convention. It builds on the previous report (submitted to COP-3), and, pursuant to the discussion of the Parties at COP-3, proposes a mechanism, once finalized, for countries wishing to use common customs codes for the implementation of Article 4. In the submissions from various Parties there were very few ten-digit statistical codes proposed or already in use for these products (eight-digit tariff codes were provided in most cases). Considering relevant product descriptions, the 2021 report proposes ten-digit customs nomenclature codes for Annex A products in cases where none had been indicated by Parties. The ten-digit codes have been proposed in the report both for consistency and to minimize the need for Parties to reconsider their current eight-digit codes. The overarching goal of this initiative, if implemented, is to help facilitate the phase-out of the mercury-added products listed in Part 1 of Annex A of the Convention.

In addition, enhancing the quantity and quality of data generated by the Harmonized System could allow for the collection of information distinguishing between mercury-added and non-mercury added products, which would facilitate implementation of Article 4, ease and improve overall reporting, assist compliance and foster better communication among trading partners.

- **Mercury in Products-Specific Webinars:** In a continuing effort to provide outreach on the challenges and lessons-learned in global efforts to assess mercury-added product phase-out potential, including discussions of mercury-free alternatives, a future webinar on dental amalgam is currently being considered. These efforts would seek to build on the successes of the Partnership area webinars on mercury-added medical devices and cosmetics conducted in 2020 in cooperation with WHO and the Zero Mercury Working Group, as well as a webinar on mercury-added lamps in December 2021 (conducted jointly with the Waste Management Partnership).
- **Skin-Lightening Cream Campaign (ZMWG)³⁰:**
 - A new round of sampling of skin-lightening cream products for mercury started in November 2020 and was completed, with a report in 2022³¹. 271 samples have been collected and tested from more than 40 e-platforms, from 17 countries, with the assistance of the ZMWG network. Nearly half of the samples contained too much mercury; 36 brands on 30 web sites were found with high mercury levels and some products had thousands of times more mercury than legal limit.
 - ZMWG collaboration with NGOs worldwide has continued and a third regional testing hub was established in Antigua and Barbuda (to cover North, Central and Latin America), in addition to the two existing regional testing hubs in the Philippines (to cover Asia), and Ivory Coast (to cover Africa) in order to facilitate the testing of online products previously determined by the government analysis to have high mercury levels. In this context, various online platforms have been identified as selling high mercury skin lighteners. More information may be found in the report.
 - Monitoring work is also included in the report, building on prior results from 2019, including checking availability of skin lightening products on e-platforms on a bi-monthly basis. It also included highlighting the enforcement report³² and identifying national capacity-needs. A questionnaire and a complementary supportive information document were developed to assist this work.
 - Most important to highlight is the continuous presence of potentially high mercury creams in the e-platforms and the necessity to reform the on-line platforms' third-party liability regime. There is generally a growing market share of e-commerce and third-party sellers are often outside the countries. Non-domestic online sellers evade domestic laws that 'brick and mortar' stores must comply with. As a result, there are violations on health and safety laws that threaten public health and also create an uneven playing field.
 - A new online database providing information on the skin-lightening products tested so far by ZMWG and other sources is now available at <https://www.zeromercury.org/cream-catalog/>.
 - A side event presenting the report among others, was organized in the framework of COP4.2 in cooperation with the government of Antigua and Barbuda on 10 March 2022.
- **Capacity Building Related to Multilateral Environmental Agreements (MEA) in African, Caribbean and Pacific (ACP) Countries - Phase 3 (ACP-MEA's) project:** Under this project which began at the end of 2020, the EEB/ZMWG is focusing its work on the formulation of specific strategies in selected ACP countries for addressing the mercury-added product phase out provisions under Article 4 of the Minamata Convention. Activities are targeted mainly in the Caribbean and African regions. In the Caribbean, EEB/ZMWG is collaborating with CARICOM and BCRC Caribbean.
 - The EEB/ZMWG under the ACP MEAs III programme has established memorandum of understanding with the governments of Trinidad and Tobago (TTO), Antigua and Barbuda (ATG) and St. Kitts and Nevis (SKN), to carry out work towards phasing out mercury added products. In summary the activities, focus on the following areas:
 1. Developing a roadmap for phasing out mercury-added products

³⁰ <https://www.zeromercury.org/mercury-added-skin-lightening-creams-campaign/>

³¹ <https://eeb.org/wp-content/uploads/2022/03/ZMWG-Skin-2022-Report-Final.pdf>

³² <https://www.zeromercury.org/wp-content/uploads/2019/11/Enforcement-measures-to-restrict-high-mercury-cosmetic-products-under-the-Minamata-Convention.pdf>

2. Carrying out market studies of mercury-free alternatives
 3. Assessing/focusing institutional capacity
 4. Developing a strategy on mercury-free product procurement
 5. Developing a pilot project on single stream product management
 6. Supporting the development of the National Implementation Plan
- Currently the market study on mercury free alternatives is completed for TTO awaiting final approval. Data are being collected thereof for ATG and SKN, based on the developed questionnaires. Mercury free procurement policies are being developed on measuring devices, dental and lamps following relevant surveys circulated.
 - In Africa, activities have been ongoing with NGO partners from Kenya and Nigeria in supporting the implementation and enforcement of Article 4 provisions. An investigative report on production/trade of illegal mercury-added skin lightening cosmetics in Kenya has been finalized. Meetings were organized also in Uganda and the skin lightening cream report and work was presented to relevant authorities and at the Mining Occupational Safety and Health (MINOSH) International conference in September 2022.
- **Phase-Out of Fluorescent Lighting:** Governments around the world have been reviewing their lighting markets and working on adopting regulations that phase-out fluorescent lighting. These activities have resulted in the adoption of policies that phase-out fluorescent lamps from the market, shifting instead to cost-effective, mercury-free, energy-efficient LED lamps. Below are some of the new policies that have been adopted:
 - Southern African Development Community (SADC) – 16 African countries adopted regionally harmonised quality and performance [standard HT 109:2021](#) in June 2021; this standard establishes minimum efficacy standards that phase-out fluorescent lamps
 - East African Community (EAC) – 7 African countries adopted regionally harmonized quality and performance [standard EAS 1064-1:2022](#), Lighting Products – Minimum Energy Performance Standard (MEPS) – Part 1 – Lamps on 1 July 2022 which establish minimum efficacy standards that phase-out fluorescent lamps.
 - European Union – Restriction of Hazardous Substances EU RoHS banned on general purpose fluorescent ([CFL](#), [LFL](#)) in February and August 2023.
 - Vermont (United States) – The state of Vermont enacted legislation that established a ban on the sales of compact fluorescent lamps ([CFLs](#)) in February 2023 and adopted a new law that bans all four-foot linear fluorescent lamps ([LFLs](#)) in 2024.
 - California (United States) – The state of California adopted [legislation \(AB 2208\)](#) that phases out all fluorescent lighting (CFLs and LFLs) by 1 January 2025.

In addition to these, information and resources have been prepared which help to demonstrate the opportunity to transition to mercury-free lighting, including the benefits from a health, economic and technical perspective. Some of these resources prepared include the following:

- [Technical & Economic Assessment of Mercury-Free Lighting](#): Global Overview & Regional Profiles, March 2022. A market study covering over 35 countries and thousands of lamps analysed demonstrating the technical and economic feasibility of switching from fluorescent lamps to LED in all of these countries, spanning three regions: Africa, GRULAC and Asia-Pacific.
- [Mercury in Fluorescent Lighting: Unnecessary Health Risks & Actionable Solutions, October 2021](#). This report outlines the health risks and environmental impacts of fluorescent lighting, highlights the many compelling advantages of transitioning to LED alternatives, and gives actionable solutions to phase out mercury-added lamps in the United States.
- [Farewell to Fluorescent Lighting: How a Phaseout Can Cut Mercury Pollution, Protect the Climate, and Save Money](#), March 2022. This study finds that drop-in LED replacement lamps are available for all common linear fluorescent tubes, pin-based compact fluorescent lamps, and specialty applications in the United States.

Finally, the EEB contributed to the European Union decision to ban the putting on the EU market of toxic fluorescent lightbulbs. However, exports from the EU could continue. In cooperation with the Clean Lighting Coalition (CLiC), the EEB has been supporting relevant work at the Minamata Convention level (e.g., via the co-organisation of a relevant side event with CLiC).

- **Make Dental Amalgam History Campaign (World Alliance for Mercury-Free Dentistry):** The World Alliance for Mercury-Free Dentistry, its five regional environmental health centers, its NGO partners in dozens of nations, and its professional advisors in medicine, dentistry, law, and journalism work in every region with major successes as the Minamata Parties accelerate the phasing down and move toward phasing out dental amalgam. Existing projects include:
 - Assisting countries in implementing the worldwide game changer for dental amalgam, the Children’s Amendment, unanimously adopted by the Parties at Minamata COP 4 in March 2022. It creates a new worldwide floor, aiming to end amalgam for deciduous teeth, for children under 15 and for pregnant and breastfeeding women, requiring each non-exempted Party to take affirmative steps toward that goal.
 - Working with the World Health Organization to urge that implementation of the new Children’s Amendment be incorporated in its updated draft Global Oral Health Action Plan.
 - Ending amalgam use in government programs, in military dentistry, in young women, and in other subpopulations as the pathway to full phaseout, a result that has now been reached by several countries.
 - To end supply of mercury fillings, shifting dental school education to 100% focus on mercury-free dentistry, and persuading dental product companies to stop selling amalgam—as both U.S. publicly-traded manufacturers did in the wake of the U.S. FDA Safety Communication.
 - To end demand for mercury fillings, enhance consumer and parent education to choose toxic-free safe dental materials for themselves and their families.
- c) Planned future activities include:
 - Continuing to support efforts related to the report on HS codes initiative (including through coordinating meetings and assisting in sharing materials);
 - Exploring organizational modifications to enhance operations of the Partnership area;
 - Continuing to identify and promote viable, available and cost-effective alternatives to mercury-added products;
 - Compiling a list of projects and other publicly available resources on mercury-added products and alternatives; and
 - Sharing the progress of the U.S. mercury inventory and the U.S. Food and Drug Administration recommendations for certain high-risk populations regarding mercury-added dental amalgam³³.

5) Mercury releases from coal combustion

- a) The objective of the Partnership area is the continued minimization and elimination of mercury releases from coal combustion where possible. It also aims to provide technically sound information on cost-effective approaches for enhancing reductions of mercury emissions, particularly for developing countries and countries with economies in transition. No numerical targets are established for the Partnership area.
- b) Key activities in the Partnership area include:

The International Centre for Sustainable Carbon (ICSC, formerly IEACCC; Co-lead of the Partnership area) won a US State Department NOFO project to evaluate and reduce mercury emissions from the coal combustion sector in India and Indonesia³⁴.

For Indonesia, the project is comprised of three phases:

- **Phase 1:** Evaluation of mercury emissions from all coal-fired plants, current and impending, in order to rank the plants and identify three for closer investigation with respect to emission reduction strategies. This Phase is now complete, and the results have been published in a report, which is available on the ICSC website³⁵. The three selected plants have agreed to collaborate with the project, along with the Ministry of Minerals and Energy Resources (MEMR) and the Ministry of Environment and Forestry (MOEF).

³⁴ Further information on this work is available from the website: <https://www.sustainable-carbon.org/outreach-programme/>

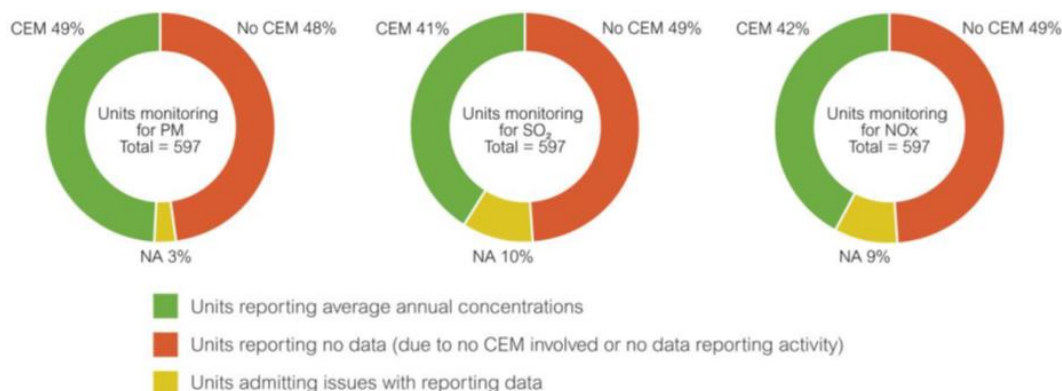
³⁵<https://www.sustainable-carbon.org/outreach-programme/>

- **Phase 2:** Calls on the Partnership area and other interested parties to focus on the configuration of the three selected plants in order to collate a “catalogue” of potential mercury reduction techniques and technologies, especially options which can be replicated across the rest of the coal fleet. Delivery of mercury monitoring and training workshops to Indonesian stakeholders and plant operators, with partners providing some of this training and insight. This phase of work will proceed as soon as COVID-19-related travel limitations are lifted.
- **Phase 3:** Determination of potential funding and cost-leveraging options available to move mercury reduction policies and projects into practice in Indonesia. This may be the most challenging phase of the project since it is clear that most international funding agencies are moving away from funding fossil fuels. However, it is hoped that some funding and co-finance can be identified to help actualise at least one full-scale retrofit. Members of the Partnership area proposed a USTDA project to further develop bankable demonstration projects for mercury reduction in Indonesia. The proposal has passed the first round of review and the Partnership area will be updated if and when the project is given full approval.

For India, the project focuses on capacity building and training on mercury emission monitoring and control through three pillars of work:

- **Pillar 1** – Emissions monitoring at coal plants. The new emission limits for particulate matter (PM), SO₂, NO_x and mercury in India require associated means to ensure that plants comply with these limits. The National Pollution Control Board (NPCB) in India now requires individual coal-fired units install CEM (continuous emission monitoring) systems on all units to report emission data electronically, in real-time, to the State Pollution Control Boards (SPCB). Guidelines have been issued, which require CEM systems to be installed in such a way that remote calibration can confirm CEM performance and data tampering is avoided. This is, in theory, a good way to ensure that plant emissions can be policed, and appropriate actions can be taken swiftly to curb exceedances. However, in practice, the system faces several challenges.

The figure below shows the status of installation of CEM systems across the coal power fleet in India, based on data reviewed by the ICSC.



For all pollutants, fewer than half of the coal units have CEM systems in place. Between 3 and 10% of the fleet are reporting technical issues with the systems they have in place for PM, SO₂ and NO_x (there are few, if any, plants with emission monitoring for mercury in place).

In practice, this means that well over half of the coal-plants in India are unable to determine whether they are in compliance with the emission standards. If the emission standards are to achieve the desired reduction in emissions and improvement in air quality, then it is imperative that steps are taken to resolve these monitoring and reporting challenges.

- **Pillar 2** - Reducing emissions and improving ash management.
- **Pillar 3** - Flexibility in operating coal plants. This pillar builds upon a previous project between the USDOE, USAID, EPRI and NTPC in India which developed a toolkit to maximize the flexibility of coal-fired power plants. The current project has identified the potential for the flexibility toolkit in India and has designed a programme to deliver hands-on training.

The Partnership area is now working with Indian stakeholders to deliver training and capacity building on emissions monitoring. It is hoped that four regional workshops can be held in India over the next 12-18 months. More details will be provided on the ICSC website once these events are finalised.

In April 2021, the GEF CEO approved a medium-scale UNEP project entitled: “Assessment of existing and future emissions reduction from the coal sector toward the implementation of the Minamata and Stockholm Conventions” to be executed by the Partnership area leads, Macquarie University and the ICSC, with expertise and input from the Partnership area. Uniquely this new project will address the implementation of the Minamata and Stockholm Conventions, and also be aligned with the commitments countries make under the UN Framework Convention on Climate Change (UNFCCC). This project commenced in October 2021, and consists of two components:

- A comprehensive coal sectoral analysis, which will review scientific data on mercury/POPs/GHGs from the coal sector and estimate future emissions in the light of the UNFCCC Paris Agreement commitments and targets.
- The synthesis of strategies, including policy guidance, for the coal sector’s emissions reduction contribution to the Stockholm and Minamata Conventions.

The project will engage extensively with international stakeholders, including UNEP, the UNEP Global Mercury Partnership, the International Centre for Sustainable Carbon, Parties and Secretariats to the Stockholm and Minamata Conventions, and relevant civil society groups. A project initiation workshop was held in March 2022.

The *first workshop session* included background on the GEF project, including information on the global use of coal in the energy mix, listing commitments made by countries under the UN Conventions, and challenges faced by countries to mitigate emissions from their coal sector. The two major project outcomes, namely a (1) Comprehensive coal sectoral analysis, and (2) Strategies for the coal sector’s emissions reduction contribution to Stockholm and Minamata Conventions, were discussed along with the project workplan that described the activities for reaching these outcomes throughout the project.

Following the progress that was made since the discussions during the project inception workshop, an inventory of country-specific reports and peer-reviewed journal publications (post 2017) is ongoing, including preliminary country-specific reports for China, Indonesia, and Vietnam. Detailed discussions with key stakeholder groups from each country setting is progressing to tailor the country-specific reports and to establish the sharing of information. Interested parties are welcome to get in contact with the project team to expand on stakeholder engagement during the project timeframe. The project progress results and outcomes were presented at the virtual ICMGP 2022 conference in July 2022.

The following outputs for the project are in development and will be reported on throughout the remainder of the project reporting period:

- a) Dissemination of scientific data on mercury, persistent organic pollutants, and greenhouse gas emissions from coal-fired power plants to relevant stakeholders.
- b) emissions reduction scenarios from coal-fired power plants based on country-specific socio-economic challenges and energy development plans.
- c) Synthesise results from completed and/or ongoing coal-fired power plant projects on emissions reduction potential.
- d) Generate selection criteria for future projects based on the highest impact potential of available best available technologies and best environmental practices (BAT/BEP) in selected countries.
- e) Provide policy guidance for Parties to the UN Conventions on decision-making processes towards emission controls in the coal sector.
- f) Produce a detailed report and communication material on the project findings and disseminated through a dedicated platform.

The Partnership area held its annual meeting in September 2021, in an online setting. Amongst others, the meeting welcomed new partners, and discussed recent and upcoming activities, events and projects. Participants were also provided with an overview of the above-mentioned GEF project and exchanged on potential contributions by the Partnership area and partners. The meeting also offered a deep dive into the Interactive Process Optimization Guidance (iPOG)³⁶.

³⁶ <https://www.unep.org/globalmercurypartnership/events/unep-event/partnership-area-mercury-releases-coal-combustion-2021-meeting>

Outreach: The Partnership area contributed to the Minamata Online series of events, and co-organized with the Secretariat of the Minamata Convention and the ICMGP a Webinar on “Mercury emission from coal”, providing amongst others a summary of the project work in Asia, in November 2021³⁷. The Partnership area contributed to a plenary on “Mercury Emissions from Industrial Sources” at ICMGP-15 held online in July 2022. The Partnership area also hosted a half-day workshop ahead of the ICMGP online event in July, with a focus on giving hands-on training with the iPOG mercury emission estimation tool.

The Partnership area continues to deliver training and capacity building in India as part of the USDOS project. Four workshops will be held in India in November 2023 – two on emission monitoring will be provided in Visakhapatnam and New Delhi and two on coal plant flexibility and efficiency will be held in Raipur and Ahmedabad. Four more workshops, focussing on co-benefit mercury reduction at Indian coal-fired power plants, will be held in early 2023. A workshop on emission reduction strategies for Indonesia will be held in Jakarta also in early 2023. It is then hoped that a MEC (Mercury Emissions from Coal) event will be held in Jakarta in mid-2023 and this will likely act as the annual meeting of the Partnership area.

6) Mercury waste management

- a) The objective of the Partnership area is to promote the environmentally sound management of mercury wastes by developing and disseminating relevant materials, enhancing capacities and awareness and providing specific solutions at the global, regional and local levels.
- b) Key activities under this Partnership area include:

Partnership area meetings: The mercury waste management area (WMA) held four meetings during the period of December 2020 to October 2022. The latest 2022 meeting took place in Singapore on 20 September 2022 with both in-person and remote participation. The primary objectives of these area meetings were to review ongoing activities by the Partnership area and consider future ones; identify technologies and services on mercury waste management that partners can provide and challenges on mercury waste management that countries have faced in order to bridge mercury waste management expertise and needs for assistance; explore opportunities for collaborative works within and beyond the Partnership area; and develop the WMA activity plan for 2021-2023³⁸.

Catalogue of Technologies and Services on Mercury Waste Management: The Catalogue has been developed to disseminate information on technologies, products and services of partners related to mercury waste management. It has been updated annually and the latest version of 2022 is available on the Partnership website³⁹.

Survey to identify the needs for technologies and services on mercury waste management: In considering future activities, the WMA conducted a survey in 2021 to identify specific types of treatment operations and processes of mercury waste and relevant measures that require enhanced actions for the environmentally sound waste management. The questionnaire was circulated among WMA Partners and other Partnership areas through the Secretariat of the Partnership in January and February 2021.

The responses to the survey (41 responses from governments, industries, NGOs, IGOs, and academia) highlighted that the management of wastes containing mercury or mercury compounds, particularly waste from fluorescent lights and from measuring devices, were the utmost challenge among the three types of mercury wastes defined under Article 11 of the Minamata Convention. In addition, respondents indicated challenges at every phase of the mercury waste management process, especially at collection. Types of support requested from the WMA included capacity-building, technical assistance, regulatory arrangement, development of guidance and tools, financial resources and project development. The results of the survey were shared at the Partnership area meeting in March 2021 to consider future activities of the WMA⁴⁰.

³⁷ <https://www.unep.org/globalmercurypartnership/events/unep-event/minamata-online-season-2-webinar-mercury-emission-coal>

³⁸ The Activity Plan can be found at : https://wedocs.unep.org/bitstream/handle/20.500.11822/38386/WMAplan_22-24.pdf?sequence=3&isAllowed=y

³⁹ <https://web.unep.org/globalmercurypartnership/catalogue-technologies-and-services-mercury-waste-management-2021-version>

⁴⁰ <https://wedocs.unep.org/bitstream/handle/20.500.11822/35795/WMAP.pdf?sequence=3&isAllowed=y>

Waste Management Area Activity Plan (2022-2024): At its March 2021 meeting, the Partnership area agreed to develop its Activity Plan for 2022-2024, taking into account the results of the survey. After the meeting, co-leads of the Partnership area developed a draft activity plan including a “Response List” describing needs identified through the survey and corresponding resources already available in order to explore gaps that the WMA could potentially fill. The draft WMA activity plan also includes prospective activities that the WMA will implement in the area of capacity-building, update of currently available resources and solution exchange.

Working Groups to promote the management of mercury wastes: At its July 2021 meeting, the Partnership area agreed to establish three working groups focusing on “development and/or refinement of currently available resources”, “capacity-building and awareness-raising” and “solution-exchange” under the WMA. Accordingly, members of each working group nominated leader(s) and developed draft work plans for 2022-2024 in light of the WMA Activity Plan.

As part of the deliverables of the working group on “capacity-building and awareness-raising”, the Partnership area organized an online information-sharing session in February 2022 entitled “Treating Mercury Wastes: Tools and Technologies”⁴¹, which presented available resources and showcased technologies for treating mercury wastes, featuring experience in different parts of the world.

Collaboration with other Partnership areas: The WMA and Mercury in Products area jointly organized an online information-sharing session dedicated to the phase out of mercury-containing lamps in December 2021 to explore options for an effective transition away from these products, their substitution as well as management and disposal once they become waste⁴². Similarly, the WMA co-organized a side event at the BRS (Basel, Rotterdam and Stockholm) COPs entitled “Mercury Wastes: latest developments, tools and practices for their environmentally sound management” together with the Mercury Supply and Storage area and the Secretariat of the Minamata Convention on 9 June 2022, where the WMA introduced the “Catalogue of Technologies and Services on Mercury Waste Management” and the Factsheet to be developed with the International Solid Waste Association (ISWA), and WMA partners from industries shared their mercury waste treatment technologies with their good practices.

Dissemination of resources developed under the Partnership area: The Partnership area collaboratively organized the session on Making Sound Decisions in Waste recovery which was entitled “Turning a mercury policy into practices” on 22 September 2022 during the ISWA World Congress 2022 in Singapore. The session presented the Factsheet, and practical technologies for mercury waste treatment on the ground were shared by a WMA Partner. Minamata online held on 5 October 2022 was another event through which the WMA broadly shared its activities and resources being developed.

c) Planned future activities for 2022 – 2024 include (but are not limited to):

- Development of Factsheets on the Environmentally Sound Management of Mercury Wastes in collaboration with the ISWA, in order to provide for specific types of mercury wastes a practical and comprehensive overview of the different measures at every step of the waste management process, while complementing the technical guidelines for the environmentally sound management of mercury wastes under the Basel Convention.
- Mapping or developing a list of mercury wastes treatment facilities around the world.
- Organization of a joint webinar with the mercury cell chlor-alkali production area to address excess mercury from the decommissioning of chlor-alkali facilities and conversion to non-mercury processes.
- Formulation and operationalization of a solution exchange platform including its pilot phase related to challenges on mercury waste management, where stakeholders can inquire for solutions and receive corresponding feedback from identified relevant resource-providers to facilitate matchmaking.

⁴¹ <https://www.unep.org/globalmercurypartnership/events/unep-event/webinar-treating-mercury-wastes-tools-and-technologies-15-february-2022>

⁴² <https://www.unep.org/globalmercurypartnership/events/unep-event/webinar-phasing-out-mercury-added-lamps-7-december-2021>

7) Mercury supply and storage

- a) The overall objective of the Partnership area is to minimize and where feasible, eliminate mercury supply considering a hierarchy of sources, and retire mercury from the market for its environmentally sound management. In practice, it aims to:
- Eliminate the production and export of mercury from relevant mercury supply sources;
 - Determine how much mercury will become available from primary mining, decommissioning of mercury chlor-alkali plants and the quantity of by-product mercury generated from non-ferrous metal processing, gold mining as well as oil and gas production; and
 - Collect and disseminate information on options and technologies for storage or final disposal of excess mercury supply from different sources.

- b) Key activities in the Partnership area include:

Study report on “Mercury from Oil and Gas”. The International Society of Doctors for the Environment (ISDE), commissioned by the Secretariat, has been working on the final version of this report. Spain and Uruguay, as Partnership area leads, have collaborated in the preparation of this report. Finalization of the report included review of comments received from various partners. The final draft was published at the beginning of November 2022.

BRS COPs Side event: Mercury Wastes - latest developments, tools and practices for their environmentally sound management. The Partnership, its Areas of work on Mercury Waste Management and on Mercury Supply and Storage as well as the Secretariat of the Minamata Convention jointly organized a side event on "Mercury Wastes: latest developments, tools and practices for their environmentally sound management" in the margins of the 2022 meetings of the Conference of the Parties to the Basel, Rotterdam and Stockholm Convention on Thursday 9 June 2022. The event showcased latest developments under the Minamata and Basel conventions and the Partnership, shared best practices in selected sectors, presenting key findings from the study reports on mercury from non-ferrous metal and oil gas, and featured experience from countries and the industry in the practical implementation of sound management practices.

Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean (BCRC-Caribbean). Over the last year, this centre has been involved in and planned activities related to the Supply and Storage Area objectives through the following projects:

- GEF 10153: Development of National Action Plan for Artisanal and Small-scale Gold Mining in the Co-operative Republic of Guyana (Guyana NAP). These activities included an assessment, which identified the sources and supply of mercury used in the national ASGM sector. This assessment included key strategies such as increased education and awareness on safe mining practices and storage of mercury.
- GEF ISLANDS: Implementing Sustainable Low and Non-chemical Development in Small Island Developing States (ISLANDS) Child Projects 10279 and 10472. This project is currently in inception phase. Relevant activities include: strengthening capacity for the development of environmentally sound management strategies to eliminate selected mercury-added products, improving capacity and infrastructure for the management of hazardous wastes, and supporting the environmentally sound management of mercury from CFL bulbs.

Alianza Contaminación Cero (Zero Pollution Alliance) of Panama organized a Minamata Convention public awareness event "Make Mercury History", in which participants viewed "The Minamata Photographer" and were informed about the dangers of mercury exposure.

- c) Planned future activities include:

- Enhance the collaboration between members of the Partnership area and welcome new members by holding an online meeting at the beginning of 2023, with the collaboration of the Secretariat.
- Webinars open to the public with experts on mercury supply and storage.
- Collaborate with industry for the environmentally sound management and storage of mercury in the sectors of chlor-alkali, non-ferrous metals and gas production.
- Collaborate with the Partnership area on mercury waste management to further consider the issue of the sound disposal of mercury waste generated by the oil and gas and non-ferrous metals smelting sectors and how much (if any) of this waste may enter the informal mercury market.

- Collaborate with relevant stakeholders in developing guidance to ensure the mercury requisitioned by local authorities is safely disposed of and remains properly stored.
- Promote the replication of successful workshops.
- Promote transparency and traceability throughout the whole life cycle of mercury, including supply sources, trade and export, to address potential illegal sources of mercury supply.

8) Mercury releases from the cement industry

- a) The objective of the Partnership area is to minimize mercury releases to the environment from cement manufacture. It aims to supplement existing programmes in key, strategically selected ways to ensure that reductions are globally significant.

Partnership area work was kicked off at the annual meeting held on 8 December 2021, where Zaigham Abbas (Ministry of Climate Change, Pakistan) was designated to serve as co-lead together with Claude Lorea (Global Cement and Concrete Association - GCCA). Participants considered the currently identified priorities of the Partnership area, namely, to support the establishment of sectoral mercury inventories; to encourage the use of most appropriate techniques to reduce or minimize mercury emissions and releases; and to reach out and raise awareness on the topic.

- b) While key objectives and priorities of the Partnership area had remained unchanged since its establishment in 2013, the Business Plan required update on a number of items, including with regards to partners efforts and timelines, opportunities, resource mobilization, business planning process, linkages as well as the list of potential partners. The Partnership area will be reviewing the Business Plan in 2023.
- c) The partnership Area held its first technical information sharing session on "Best practices to reduce mercury emissions from the cement industry", online on 23 June 2022⁴³. The webinar aimed at exchanging on current knowledge about best practices to control and reduce emissions of mercury from the sector, but also share information on existing guidance.
- d) Amongst others, the following areas for future work were raised by participants at the annual meeting:
- Capacity building, including with respect to monitoring, identification of mercury, upgrading and training at facility and university levels;
 - Awareness raising of the cement industry on the topic of mercury, in addition to CO₂, currently a major focus of the sector;
 - Improving estimates of mercury from the sector, in particular from developing countries;
 - Sharing of information on certain topics, including with respect to:
 - mercury emissions and releases from the sector, including at regional level
 - technical solutions to measure and remove mercury
 - co-processing of waste in cement kilns
 - fate of mercury from the cement sector
 - mercury mass balance from cement plants
 - Enhancing the understanding of mercury emitted/released from the cement sector, and its distribution through long range emission vs. in oxidized form close to the plant;
 - Establishing an online library or reference centre containing test data, technical papers, and regulations;
 - Exploring opportunities for synergistic efforts in addressing mercury as well as other pollutants, such as dioxins and furans.

Future activities include further technical information sessions in 2023, with a focus on (1) mercury inventories, including at facility level, and on (2) best practices and dissemination of available guidance, including the Minamata Convention guidance on Best Available Techniques and Best Environmental Practices to control emission of mercury and mercury compounds to air from point sources⁴⁴ as well as the "guidance in measuring, controlling and reducing mercury emissions from cement manufacturing" developed by the Global Cement and Concrete Association⁴⁵.

⁴³ <https://www.unep.org/globalmercurypartnership/events/unep-event/webinar-best-practices-reduce-mercury-emissions-cement-industry-23-june-2022>

⁴⁴ <https://www.mercuryconvention.org/en/documents/guidance-best-available-techniques-and-best-environmental-practices-taking-account-any>

⁴⁵ https://gccassociation.org/wp-content/uploads/2019/10/GCCA_Guidelines_Emissions_v05_AMEND.pdf