



UNEP GLOBAL MERCURY PARTNERSHIP

Yellowfin Tuna, Courtesy NOAA Fisheries, © Photo by Jeff Muir

INFORMATION ON BECOMING A PARTNER

This information sheet provides an overview of the United Nations Environment Programme (UNEP) Global Mercury Partnership for prospective partners. Further information is available at:

web.unep.org/globalmercurypartnership

GOAL OF THE PARTNERSHIP

The overall goal of the UNEP Global Mercury Partnership is to protect human health and the global environment from the release of mercury and its compounds by minimizing and, where feasible, ultimately eliminating global, anthropogenic mercury releases to air, water and land.

PARTNERSHIP AREAS

The UNEP Global Mercury Partnership is a voluntary and collaborative relationship between various parties, governmental, non-governmental, public and private, in which all participants agree to work together in a systematic way to achieve its goal.

Initiated in 2005¹, the Partnership today focuses its work 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.

¹ UNEP Governing Council Decision 23/9

The Partnership is structured around eight areas:

- Artisanal and small-scale gold mining
- 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
- Mercury releases from the cement industry

OUR PARTNERS

Over 190 partners from governments, IGOs, NGOs, private sector and academic institutions:

- Support the overall goal of the Partnership.
- Contribute resources or expertise to the development and implementation of Partnership activities.
- Network with other organizations, agencies, entities and individuals addressing mercury issues.

BECOMING A PARTNER

To become a partner, interested entities or individuals should submit a letter to UNEP signifying their support for the UNEP Global Mercury Partnership and their commitment to achieving its goal. The letter should also specify how they will contribute to meeting the goal of the Partnership.

Together with this letter, UNEP requests interested entities or individuals to also complete and submit the registration form (see reverse). Participation in the UNEP Global Mercury Partnership will be confirmed by UNEP. Partners' letters of support will be made public through the UNEP's website.

SUPPORT LETTER AND REGISTRATION FORM SHOULD BE SUBMITTED TO:

**Head, Chemicals and Health Branch
Economy Division
United Nations Environment Programme**
Palais des Nations
8-14 avenue de la Paix
CH-1211 Geneva 10, Switzerland
E-mail: metals@un.org



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PARTNERSHIP AREAS

Please check the partnership area(s) to which your organization intends to contribute to:

- Artisanal and small-scale gold mining
- Mercury releases from coal combustion
- Mercury cell chlor-alkali production
- Mercury waste management
- Mercury air transport and fate research
- Mercury supply and storage
- Mercury in products
- Mercury releases from the cement industry

> Please specify in your support letter how your organization intends to contribute to each of the selected partnership area(s).

ORGANIZATION APPLYING TO BECOME A PARTNER

Name of
Organization:

Type of
Organization:

- Government
- Intergovernmental Organization
- Non-governmental Organization
- Industry
- Academia
- Other, please specify

Mailing
Address:

Postcode:

City:

E-mail:

Telephone:

Website:

ORGANIZATION'S REPRESENTATIVE TO THE UNEP GLOBAL MERCURY PARTNERSHIP

Mr. Ms.

First Name:

Last Name:

Functional Title:

Section / Department:

E-mail:

** UNEP Global Mercury Partnership registration forms are to be accompanied by a letter to UNEP signifying support for the UNEP Global Mercury Partnership and commitment to achieving its goal. The support letter should specify how the organization intends to contribute to meeting the goal of the UNEP Global Mercury Partnership. Please submit the support letter and registration form to:*

**Head, Chemicals and Health Branch, Economy Division
United Nations Environment Programme**
Palais des Nations
8-14 avenue de la Paix
CH-1211 Geneva 10, Switzerland
E-mail: metals@un.org



To
Head, Chemicals and Health Branch,
Economy Division United Nations Environment Programme
Palais des Nations 8-14 avenue de la Paix
CH-1211 Geneva 10, Switzerland
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Object: Application to Global Mercury Partnership

Dear Sirs,

In order to achieve the membership of the UNEP Global Mercury Partnership, this document is meant to introduce the team of researchers of the Institute of Geosciences and Earth Resources (IGG) of the National Research Council of Italy (CNR) and its ten-year scientific activities related to the geochemistry of mercury.

The main topics of our studies are mainly focused on:

- Fate, transport, reaction processes and dispersion pathways of mercury in different environmental matrices such as water, air, stream sediments and soils, and the interaction with the biological sphere.
- Natural and anthropogenic-derived sources: from volcanic, hydrothermal and geothermal environments to industries, mines and urban frameworks.
- Remediation of mining sites where cinnabar was converted to metallic Hg and its distribution in the different matrices.

The main study area is located in the Mt. Amiata (Tuscany, Italy), the most recent volcanic apparatus of the Tuscan Magmatic Province, and the second largest geothermal system of Italy after Larderello-Travale, also located in Tuscany. The place has been known since the Etruscan times for the exploitation of cinnabar



(HgS), which cumulated in modern times (from 1847 to 1974), when the mercury mining district became the 4th most productive in the world. In 1925, >50% of mercury worldwide was provided by the Mt. Amiata mining district and about 70% of it was from the Abbadia San Salvatore area, where liquid mercury was produced from roasted cinnabar. Since 2010, a large effort was carried out by the local authorities to increase the knowledge about the Hg-related environmental issue, including mercury distribution in underground and surface waters, air, stream sediments, soils, building materials and mining structures. Consequently, extensive analyses of mercury were carried out in this mining district, showing several criticalities in terms of gaseous elemental mercury (GEM, Hg⁰) and total and leachable mercury in air and natural and anthropogenic materials from the edifices and mining structures, respectively. These data are going to be used during the remediation activities of the mining area of Abbadia San Salvatore, with the final purpose of recover it for historic museum and mining park purposes.

Particular interest has been devoted to the dispersion of Hg in the draining network, most notably in the Paglia River catchment, draining the eastern side of the district. The Paglia river enters the Tiber River, the main watercourse in Central Italy, going through Umbria and Latium regions crosscutting the capital city of Rome, and finally flowing into the Mediterranean Sea. Along the Paglia and Tiber River sediments and soils show anomalous Hg levels (up to thousands of $\mu\text{g/g}$) for over 200 km downstream of the Mt. Amiata mining area, highlighting an extreme case of long-range Hg contamination. In the Paglia River, a correlation between dissolved element (presumably as Hg²⁺) and methyl-Hg was observed and some fishes were also found to contain relatively high methyl-Hg concentration. In the stream sediments of Paglia River, a significant correlation between the concentration of Total Organic Carbon (TOC) and methyl-Hg was found and surface waters and soils showed relatively high contents of Hg and methyl-Hg. The Hg transport across the basin mostly occurs as



suspended particulate, and its distribution is strongly influenced by fluvial dynamics. Another study of interest is the one linked to the geothermal industrial activity. In the 1960's, a few years before the end of mercury mining, high temperature ($>250^{\circ}\text{C}$) geothermal fluids started to be extracted from deep hydrothermal reservoirs hosted in the geological units underlying the volcanic apparatus, for producing electric power and for district heating. The high gas content of the geothermal fluids induces emissions of volatiles, including mercury, from both natural manifestations and industrial plants. Among other studies related to environmental aspects of geothermal development in the framework of National and European projects, a sampling protocols was developed for the determination of mercury emissions from the plants cooling towers and efficient abatement systems for H_2S and Hg were applied. Following this, monitoring campaigns of the concentration of mercury in the plants emissions and air quality measurements were conducted in collaboration with industries and regional authorities (i.e. Regional Environmental Protection Agency, Tuscany Regional Authority) for regulatory purposes. Moreover, to complement direct instrumental measurements of gaseous Hg in air, studies were carried out to promote the use of tree barks and lichens as biomonitors of airborne mercury.

In order to improve our understanding on the geochemical behavior and dispersion of gaseous mercury, several campaigns were also carried in quiescent and active volcanic areas, e.g. Solfatara crater (Campania, Italy), Mt. Etna volcano (Sicily, Italy) and Nisyros island (Greece). Real-time and high frequency measurements of GEM concentrations with portable instruments (i.e. Lumex[®] RA-915M) were coupled with those of other gaseous compounds (e.g. H_2S and SO_2), in order to characterize in detail the emission sources and to build iso-concentration maps of the different pollutants, thus providing new insights into GEM behaviour once released in the air.

A new method to determine diffuse soil GEM fluxes was also set up and applied at



Solfatarata crater and “*Le Biancane*” natural park in the Larderello-Travale geothermal area (Tuscany, Italy) by using a static closed-chamber (SCC) in combination with a Lumex[®] RA-915M analyzer.

Most recently, GEM surveys were conducted in peculiar environments such as the historical herbaria of Florence (the Erbario Centrale Italiano and its collections located in the Museum of Natural History), where high concentrations of gaseous elemental mercury were detected and are likely related to sublimation processes of HgCl₂, this compound being the most used preservative for herbaria specimens up to 1980s.

These and ongoing studies in cooperation with the regional environmental agencies will assist the authorities to take adequate steps for minimizing the risk for inhabitants and affected ecosystems. The disentangling of the many contributions of mercury contamination is still a challenge, but it represents a necessary step for the future economic development of the polluted areas.

Considering the above premises, we deem that our studies are perfectly in line with the main goal of the Global Mercury Partnership: “Protect human health and the global environment from the release of mercury and its compounds by minimizing and, where feasible, ultimately eliminating global, anthropogenic mercury releases to air, water and land”. Specifically, such a research group may play an advisory role for the transfer of the scientific results and evaluations for the stakeholders during the negotiation of the global mercury convention. We are also available to contribute to the decisions made in the last “Call for information and follow-up on the decisions adopted by the Conference of the Parties to the Minamata Convention at its third meeting (Geneva, Switzerland, 25 to 29 November 2019)”.

The proposers of the research group of the Institute of Geosciences and Earth Resources (IGG) of the National Research Council of Italy (CNR) are, in



Consiglio Nazionale delle Ricerche
National Research Council of Italy

Istituto di Geoscienze e Georisorse
Institute of Geosciences and Earth Resources



alphabetical order:

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- Dr.ssa Adele Manzella
- Dr.ssa Guia Morelli
- Dr.ssa Barbara Nisi
- Dr. Giovanni Ruggieri
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The Head of the Institute of Geosciences and Earth Resources (IGG) of the National
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Dr. Antonello Provenzale



Selected references of the IGG-CNR team

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