



Assessment of existing and future emissions reduction from the coal sector toward the implementation of the Minamata and Stockholm Conventions

Part I: Project Information

GEF ID

Project Type

MSP

Type of Trust Fund

GET

CBIT/NGI

☐ CBIT

☐ NGI

Project Title

Assessment of existing and future emissions reduction from the coal sector toward the implementation of the Minamata and Stockholm Conventions

Countries

Global

Agency(ies)

UNEP

Other Executing Partner(s):

Macquarie University

Executing Partner Type

Others

GEF Focal Area

Chemicals and Waste

Taxonomy

Focal Areas, Climate Change, United Nations Framework Convention on Climate Change, Nationally Determined Contribution, Paris Agreement, Sustainable Development Goals, Chemicals and Waste, Best Available Technology / Best Environmental Practices, Mercury, Coal Fired Industrial Boilers, Coal Fired Power Plants, Emissions, Persistent Organic Pollutants, Unintentional Persistent Organic Pollutants, Industrial Emissions, Influencing models, Strengthen institutional capacity and decision-making, Stakeholders, Communications, Behavior change, Awareness Raising, Strategic Communications, Civil Society, Academia, Non-Governmental Organization, Type of Engagement, Consultation, Information Dissemination, Participation, Gender Equality, Gender results areas, Participation and leadership, Gender Mainstreaming, Sex-disaggregated indicators, Gender-sensitive indicators, Capacity, Knowledge and Research, Targeted Research, Knowledge Exchange, Peer-to-Peer, North-South, Conference, South-South, Learning, Indicators to measure change, Theory of change, Adaptive management, Knowledge Generation

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 1

Climate Change Adaptation

Climate Change Adaptation 1

Submission Date

12/14/2020

Expected Implementation Start

2/1/2021

Expected Completion Date

1/31/2024

Duration

36In Months

Agency Fee(\$)

56,430.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CW-1-1	Strengthen the sound management of industrial chemicals and their waste through better control, and reduction and/or elimination	GET	594,000.00	652,000.00
Total Project Cost(\$)			594,000.00	652,000.00

B. Project description summary

Project Objective

Demonstrate mercury and POPs emissions reduction potential from coal-fired power plants and industrial boilers in order to support governments in implementing control and reduction strategies for new and existing sources

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
1. Comprehensive coal sectoral analysis	Technical Assistance	1.1 Estimated mercury/POPs/GHGs reductions and future scenarios for CFPPs and industrial boilers management are endorsed by high potential countries	1.1.1 Scientific data on mercury/POPs/GHGs from CFPPs reviewed, summarised and disseminated to relevant stakeholders 1.1.2 Impact of UNFCCC Paris Agreement commitments and targets on coal sector emissions analysed and disseminated to relevant stakeholders 1.1.3 Potential mercury/POPs/GHG reduction figures and scenarios from CFPPs produced and disseminated to relevant stakeholders	GET	205,000.00	262,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
2. Strategy for the coal sector's emissions reduction contribution to Stockholm and Minamata Conventions	Technical Assistance	2.1 High reduction potential countries committed to develop projects to address emissions from the CFPPs and industrial boilers	<p>2.1.1 Synthesis of results from completed/ongoing CFPP projects produced and disseminated</p> <p>2.1.2 Selection criteria for future projects based on highest impact potential defined and disseminated</p> <p>2.1.3 Policy guidance developed and disseminated to assist public and private sectors in their decision making processes toward emission controls in the coal sector</p> <p>2.1.4 Detailed reports and communication materials on project findings developed and disseminated through dedicated platform</p>	GET	295,000.00	300,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
3. Monitoring and Evaluation	Technical Assistance	3.1 Project's progress towards objectives continuously monitored and evaluated.	3.1.1 Terminal evaluation conducted in line with UNEP and GEF policies	GET	40,000.00	30,000.00
Sub Total (\$)					540,000.00	592,000.00
Project Management Cost (PMC)						
				GET	54,000.00	60,000.00
Sub Total(\$)					54,000.00	60,000.00
Total Project Cost(\$)					594,000.00	652,000.00

C. Sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
GEF Agency	UNEP Global Mercury Partnership	In-kind	Recurrent expenditures	300,000.00
Others	Macquarie University	Grant	Investment mobilized	74,000.00
Others	Macquarie University	In-kind	Recurrent expenditures	178,000.00
Others	International Energy Agency	In-kind	Recurrent expenditures	100,000.00
			Total Co-Financing(\$)	652,000.00

Describe how any "Investment Mobilized" was identified

Macquarie University will recruit a project manager

D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
UNEP	GET	Global	Chemicals and Waste	Mercury	500,000	47,500
UNEP	GET	Global	Chemicals and Waste	POPs	94,000	8,930
Total Grant Resources(\$)					594,000.00	56,430.00

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required
☐

PPG Amount (\$)
32,000

PPG Agency Fee (\$)
3,040

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
UNEP	GET	Global	Chemicals and Waste	Mercury	32,000	3,040
Total Project Costs(\$)					32,000.00	3,040.00

Core Indicators

Indicator 9 Reduction, disposal/destruction, phase out, elimination and avoidance of chemicals of global concern and their waste in the environment and in processes, materials and products (metric tons of toxic chemicals reduced)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
0.00	0.00	0.00	0.00

Indicator 9.1 Solid and liquid Persistent Organic Pollutants (POPs) removed or disposed (POPs type)

POPs type	Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
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Indicator 9.2 Quantity of mercury reduced (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
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Indicator 9.3 Hydrochlorofluorocarbons (HCFC) Reduced/Phased out (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
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Indicator 9.4 Number of countries with legislation and policy implemented to control chemicals and waste (Use this sub-indicator in addition to one of the sub-indicators 9.1, 9.2 and 9.3 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
	3		

Indicator 9.5 Number of low-chemical/non-chemical systems implemented, particularly in food production, manufacturing and cities (Use this sub-indicator in addition to one of the sub-indicators 9.1, 9.2 and 9.3 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
	1		
Indicator 9.6 Quantity of POPs/Mercury containing materials and products directly avoided			
Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

Reduction potential for the coal sector to be determined during the project for core indicator 6 and 10. For core indicator 11, the project will propose an assessment tool to estimate direct beneficiaries based on the size of the plants and surrounding communities

Part II. Project Justification

1a. Project Description

1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description);

Mercury is environmentally, an extremely harmful pollutant due to its toxicity, long range mobility, and persistence. Mercury emissions can not only cause localized harm, to which children and pregnant women are especially vulnerable, through air borne emissions or soil and water contamination, but also travel long distances that extend beyond national boundaries and have global impacts.

A key threat to human health world-wide is the eating of fish contaminated with mercury. In 2015, fish accounted for about 17 percent of animal protein consumed by the global population. Moreover, fish provided about 3.2 billion people with almost 20 percent of their average per capita intake of animal protein. Despite their relatively low levels of fish consumption, people in developing countries have a higher share of fish protein in their diets than those in developed countries.^[1] In small island states and coastal regions this amount can increase even more. As such, it is often those countries that are the least likely to produce mercury emissions that are the most negatively impacted.

The benefits of reducing exposure to mercury are extensive. A US study estimated that the cumulative lifetime benefits for affected individuals from measures that will be implemented through the Minamata Convention at \$339 billion by 2050.^[2]

Root Causes

Article 8 of the Minamata Convention addresses emissions of mercury and mercury compounds to the atmosphere. Specially, the Article puts forward measures to control emissions from the point sources within the source categories listed in Annex D to the Convention. These sources are:

- Coal-fired power plants;
- Coal-fired industrial boilers;
- Smelting and roasting processes used in the production of non-ferrous metals (where non-ferrous metals refer to lead, zinc, copper and industrial gold);
- Waste incineration facilities;
- Cement clinker production facilities.

In these activities, mercury is emitted because it is an impurity in fuels and raw materials. Mercury emissions of this type are sometimes referred to as unintentional emissions or releases. Taken together, these sources make a very substantial contribution to total emissions of mercury to the atmosphere; the most recent Global Mercury Assessment (GMA)

estimates that stationary combustion of coal contributes 21% (power plants at 13.1%) of total emissions; non-ferrous metal production 15%; cement production 11%; and disposal of mercury-containing waste 8%.

Given that these industrial sources account for 55% of total mercury emissions, a reduction of these emissions is essential to meet the overall objectives of the Convention. As the second largest single anthropogenic source of mercury emissions, the coal sector is clearly a priority area for interventions. The coal sector also has high potential for improvement as up to 95% of all mercury releases from power plants can be reduced. As such, the coal sector will be the focus of this proposed project.

Coal-fired power plants and coal-fired industrial boilers are a large source of local, regional, and global atmospheric mercury emissions, emitting over 290 metric tons annually of mercury worldwide.^[3] Coals used for combustion throughout the world contain trace amounts of mercury that, when uncontrolled, are emitted (along with other pollutants) during the combustion process.

Most coal-fired power plants are large electricity-producing plants, with some also supplying heat (combined heat and power plants, district heating, etc.). Industrial boilers provide the heat or process the steam necessary for local production at a facility. Boilers in coal-fired power plants typically consume more coal than most coal-fired industrial boilers. However, as industrial boilers generally outnumber power plant boilers, they can actually have a larger impact on total emissions. Another point of difference is that coal-fired power plant boilers are mostly single fuel, while coal-fired industrial boilers are often designed for and use a more diverse mix of fuels (e.g., fuel by-products, waste, wood) in addition to coal.

In the future it is expected that coal used for electricity production will decrease as renewable energy becomes more price competitive, and the technical issues associated with energy storage and integration into electricity grids are solved.^[4] However, many countries, including parties to the Minamata Convention, have invested in and plan to continue investing in coal-fired power in the immediate future. The most recent International Energy Agency (IEA) assessment of the market for coal makes the following relevant points with regard to the future coal sector:

- Total coal use figures are highly dependent on China. One out of every four tonnes of coal used in the world is burned to produce electricity in China. However, in the foreseeable future, Chinese environmental policies, in particular air pollution controls, will increasingly constrain coal demand.
- The unmatched period of coal power generation growth in India will continue, with power demand forecast to rise by more than 5% per year over the period until 2023. Economic growth and infrastructure development will also increase coal consumption in steel and cement production.
- South and Southeast Asian countries, including Indonesia, Pakistan, Bangladesh, the Philippines and Viet Nam, are home to more than 800 million people with an average annual per capita electricity consumption of just over 800 kWh; this is a mere one-seventh of that of the EU28. Increasing coal power generation, supported by new coal plants under construction, will result in significant coal demand growth in these countries. Southeast Asia has the fastest growth in coal demand at over 5% per year through 2023, although India, with almost 150 MT of coal equivalent (MTCE) of additional demand, supports the largest absolute growth.
- In other countries with higher per capita electricity use, like Malaysia and the United Arab Emirates, new coal plants are largely due to energy mix diversification policies.
- Western Europe is rapidly divesting from the use of coal as a source of electricity production. There are three drivers for this transformation: action on climate change, action on air pollution, and action to specifically phase out coal-fired generation. By contrast, coal demand is predicted to remain stable in Eastern Europe. In fact, a number of new coal-fired plants are currently under construction in the Balkans, Poland and Greece.

These observations reveal, firstly, that there is likely to be significant contributions of coal to electricity production in coal-fired power stations for the foreseeable future, particularly as new stations have an operating lifetime of 40-50 years. Secondly, the interactions between reductions in toxic chemicals such as mercury and POPs, action on air pollutants (acid gases and fine particles), and action on climate change through the undertakings of Parties to the Paris Agreement is complex and will determine the outcomes and successes of these linked actions.

Several factors affect the amount of mercury emitted by similar plants burning comparable amounts of coal. These factors include:

- Mercury concentration in coal.
- Coal type and composition.
- Type of combustion technology.
- Presence and mercury removal efficiency of an air pollution control system (APCS).

While the coal sector is recognised as an important contributor to mercury emissions, the potential for actual reduction associated with targeted interventions has not yet been properly assessed. Without a more detailed understanding, this information gap will continue to hinder investment and create lost opportunities for mercury emissions reductions. As such, the proposed project will incorporate a detailed understanding of recent research on the effects of these factors on baseline and projected emissions of mercury, POPs and GHGs. All these interacting factors need to be carefully considered when estimating emissions in a specific location.

Key Barriers

While the key sources of mercury emissions are known, a number of barriers stand in the way of sustainably reducing the emissions from these sectors. These key barriers, which this proposed project seeks to overcome, are outlined below:

- *Insufficient Data Availability and Case Studies:* the contribution of the coal sector to mercury emissions has been recognised by the Minamata Convention, and by extension, its signatory countries. There persists, however, insufficient scientific data on emissions reduction potential and best available practices to support informed decision making. The studies undertaken by the project will seek to overcome this barrier by collecting and analyzing available existing scientific data to provide decision-makers with clear guidance on emissions reduction potential and proposed interventions.
- *Policy Frameworks:* mercury, POPs and CO₂ emissions produced by the coal sector fall within the scope of three different multilateral environmental agreements: the Minamata and Stockholm Conventions and the UNFCCC. As such, any comprehensive study of the coal sector must consider the impact of country commitments to all three Conventions in order to develop realistic projections. To date, this has not been undertaken.
- *Lack of Awareness:* As a result of low data availability, there persists a lack of awareness in many Parties to the Convention to seek and develop the most appropriate control measures for emissions. This results in ineffective regulatory approaches and financial mechanisms aimed at halting and reducing mercury emissions.
- *Political Concerns:* governments are increasingly investing in sustainable energy sources and shifting away, both in terms of political focus and financial investment, from the fossil fuel economy. While this is a positive sign for environmental sustainability, in the short to medium term, the coal sector will continue to be a pivotal part of the global

economy and will continue to generate harmful emissions, particularly as modern new build coal-fired plants typically operate for 40-50 years. This project seeks to demonstrate the necessity of cleaning up the coal sector, even as governments continue to invest in alternative sources of energy.

2) the baseline scenario and any associated baseline projects;

Baseline Scenario:

Formation of Persistent Organic Pollutants (POPs) from Industrial Sources

Dioxins are unintentionally produced POPs emitted in relatively low concentrations that remain intact for many years and have the tendency to bioaccumulate in the fatty tissues of living organisms and the environment Polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) are a group of aromatic hydrocarbons produced by various anthropogenic thermal processes in the presence of a chlorine source.^[5] Emission of dioxins from industrial sources is a major issue, as these compounds are generated as unwanted by-products from different processes, including municipal waste incineration, electricity generation, petroleum refining, iron ore sintering and other non-ferrous metal processing.^[6]

This project offers an opportunity to evaluate accurate emission estimates for relevant POPs from the coal-fired power stations and coal-fired industrial boilers listed as Annex D sources in the Minamata Convention. Hence, although mercury will be the core focus of the project, substantial additional information will also be provided for emissions of POPs from the coal sector for the current baseline and projected future emissions.

Accurate estimates of POPs formation and measures to reduce their formation are challenging because POPs emissions are strongly dependent on plant design and operating conditions, especially the time/ temperature history of the process gases. However, guidance materials, including best available techniques and best environmental practices (BAT/BEP), have been prepared for some of the industrial sources^[7].

In the case of coal-fired power plants and industrial boilers, the volumetric concentrations of chemicals listed in Annex C of the Stockholm Convention in the emissions from fossil fuel-fired boilers are generally very low. However, the total mass emissions from the boiler sector may be significant, in terms of both tonnage and distribution, due to the scale of fossil fuel combustion for electricity generation and heat or steam production.

Measures that can be taken to decrease the formation and release of chemicals listed in Annex C include:

- Maintenance of efficient combustion conditions within the boiler and ensuring sufficient time is available to allow complete combustion to occur;
- Undertaking measures to ensure fuel is not contaminated with PCB, HCB or chlorine, and is low in other components known to act as catalysts in the formation of PCDD and PCDF;
- Use of appropriate gas-cleaning methods to lower emissions that may contain entrained pollutants; and
- Appropriate strategies for disposal, storage or ongoing use of collected ash.

The collection of the required data to assess the impact of these variables on POPs formation will clearly be challenging for existing and future facilities, and hence the estimation of POPs emissions will be subject to major uncertainties. However, the assumptions used in future projects for plant design and operating conditions and the impact of the assumptions on predicted emissions will be clearly stated.

Baseline Projects – Mercury Emissions

Minamata Convention on Mercury

The Minamata Convention recognizes the need to protect the environment and human health from the adverse effects of mercury. The Convention came into force on 16 August 2017 and as of March 2020, had been ratified by 128 countries.

Between 2010 and 2013, the international community finalized the Minamata Convention on mercury, an internationally legally binding instrument to reduce anthropogenic emissions of mercury to the environment. The Minamata Convention addresses issues of mercury supply, uses and emissions by providing the framework for countries to take coordinated actions to reduce the concentration of this toxic metal in the environment. As described earlier, Article 8 of the Convention addresses emissions of mercury and mercury compounds to the atmosphere through measures to control emissions from the point sources falling within the source categories listed in Annex D to the Convention.

Article 8 proposes separate approaches for new and existing sources. For new sources these measures require the use of best available techniques and best environmental practices (BAT/BEP). For existing sources, parties are required to develop a national plan and shall implement one or more of the following measures: (i) a quantified goal; (ii) emission limit values; (iii) BAT/BEP; (iv) a multi-pollutant strategy capable of producing co-benefits for control of mercury emissions; and/or (v) alternative measures.

The text of the Convention is accompanied by a range of guidance documents which will support its implementation.

Minamata Article 8 Guidance

The Conference of Plenipotentiaries on the Minamata Convention on Mercury that adopted the Convention in Kumamoto, Japan, in October 2013 established and mandated a group of technical experts, nominated from each region, as a subsidiary body. This body, which reports to the intergovernmental negotiating committee on mercury was mandated to develop the guidance called for in Article 8 of the Convention. The group met on four occasions: in February 2014 in Ottawa, Canada; in September 2014 in Montreux, Switzerland; in March 2015 in Pretoria, South Africa and in September 2015 in Stockholm, Sweden.

The comments received during the public comment phase were discussed at the fourth meeting of the group and addressed in a document presented at the Intergovernmental Negotiating Committee meeting (INC7) in Jordan in 2016. The group forwarded the draft guidance it prepared to the seventh session of the intergovernmental negotiating committee in documents. At that session, the committee adopted the guidance on a provisional basis, and formal adoption by the Conference of the Parties at its first meeting (COP1) followed in 2017. The documents included guidance on:

- Best available techniques and best environmental practices;
- Criteria that parties might develop pursuant to paragraph 2 (b) of Article 8;
- Preparing inventories of emissions; and
- Support for parties in implementing the measures set out in Paragraph 5 of Article 8, in particular in determining goals and setting emissions limit values.

One of the most substantial guidance documents relates to industrial emissions from coal, smelting, cement and waste incineration sectors. The guidance includes extensive discussion of BAT/BEP approaches to control or reduce the emissions of mercury. However, for many parties to the Convention there is a lack of awareness on available control measures; a lack of effective regulatory approaches to control emissions; and a lack of financial support for implementing these approaches.

The guidance will function as a crucial source of information, criteria and support as parties to the Convention develop responses to the requirements to reduce and where possible eliminate mercury emissions from the sources included in Annex D. This proposed GEF project will provide detailed information on the effect of emission controls in the coal sector on projected emissions to support this decision-making process.

UNEP Global Mercury Partnerships in the industrial sectors

The UNEP Global Mercury Partnership consists of stakeholders from governments, industry, non-governmental organizations, and academia who are dedicated to reducing mercury pollution and protecting human health and the environment from the impacts of mercury. Initiated in 2005 by a decision of the UNEP Governing Council, the Partnership plays an important role in catalysing global action on mercury and offering information, capacity-building, and awareness-raising in support of implementation of the Minamata Convention.

The industrial coal sector is addressed in the Partnership on Mercury Control in Coal Combustion. The partnerships are voluntary platforms to share knowledge and provide information on the sector and its needs. The Partnership responded to a gap in communication between the actors of the sector and led to a better understanding of the outstanding needs to be addressed.

The Coal Partnership is led by Dr. Lesley Sloss (IEA Clean Coal Centre) and Prof. Peter Nelson (Macquarie University) and has priority actions to:

- Support globally significant emissions reduction through existing multi-pollutant reduction approaches.
- Provide technically sound information on cost effective approaches for enhancing reductions of mercury emissions, particularly for developing nations and countries with economies in transition.
- Develop guidance material on how to minimize mercury releases by optimizing multi-pollutant control techniques, including improved energy efficiency, to reduce mercury-emissions;
- Collecting information to improve accuracy of future emissions inventories for the sector, including technical information on power plants and control technologies used, analysis of mercury concentrations in coals used by power plants and measurements of mercury in stack flue gases.
- Implementing studies to demonstrate the efficiency of multi-pollutant, other pollutant control techniques or mercury specific control techniques in capturing mercury and build local/national capacity on these issues, also with the aim of transferring information and lessons learnt to facilities and governments in other countries.

Hitherto, the research and other activities of the Coal Partnership have been focused on China, India, Russia and South Africa, but the results are of interest to all countries with coal combustion power plants. The work program has resulted in:

- Development of detailed guidance material, the Process Optimization Guidance (POG) Document, to reduce mercury emissions from coal combustion. The POG summarizes practices capable of providing reduction of mercury emissions from coal-fired power plants. The POG is a tool to help determine the approaches to control mercury emissions for individual coal-fired power plants, allowing for a preliminary selection of a mercury control strategy. Information from the POG (and in its online version, the iPOG) will be utilised in the proposed GEF project to estimate the impact of process and control technologies on mercury emissions to provide the best estimates of future emissions.

- The POG may also assist governments in evaluating the opportunities to achieve multi-pollutant emission reductions, such as SO₂, NO_x, PM, and mercury emissions, including improved energy efficiency. The POG focuses on providing guidance on how to optimize other pollutants controls to achieve the co-benefits of reduced mercury emissions. The interactions of the trace multi-pollutants with energy efficiency will be important in the context of countries' commitments under the Paris Agreement.
- Improvement of mercury emission inventories and related information.
- Promotion of emissions reductions through demonstration projects and other related actions.

The Coal Partnership, through projects managed by the IEA Clean Coal Centre, has cooperated with the US Environmental Protection Agency (in-kind contribution), Environmental Canada (\$50K funding for iPOG mercury estimation tool), US State Department (\$100,000 for workshops in South Africa and India), and the European Commission (\$1million for mercury inventory work on the coal sector in India, China, Russia, South Africa, Indonesia, Thailand and Vietnam). The US Geological Study has also provided in-kind support for analysis of mercury in coal and ash samples as part of this project work. These research and end-user networks will be used in the project to improve understanding of facility specific emissions. The results of these projects are all published and available on the website of Coal Partnership Area at:

https://web.unep.org/globalmercurypartnership/publication_resources?title=&field_gmp_partnership_area_value=coal&field_resource_type_value=All

The IEA Clean Coal Centre is currently leading a \$2million US State Department project to promote mercury monitoring and control in India and Indonesia. This work will provide significant training in mercury monitoring and reporting to these regions as well as guidance on strategies for reducing mercury and other emissions from the coal utility sector. This project will comprise 15 technical workshops in these regions over the next 2-3 years. Members of the Coal Partnership and its extended network of experts will be involved in providing training and input to this project.

The Coal Partnership has also: collected and disseminated information on activities of its partners; produced case studies on formalization and practical technical guidance on mercury reduction in coal combustion; organized annual meetings of Partnership members in conjunction with the Mercury and Multi-Pollutant Emissions from Coal Workshop (MEC) which has been held annually since 2004; and informed the negotiators of the Minamata Convention by providing technical input for the shaping of Article 8 and Annex D.

The Coal Partnership will remain a crucially important source of information and expertise for this project and for future enabling activities.

UNEP Global Mercury Assessment (GMA)

The fourth GMA was published in 2018 and was produced by UN Environment and the Arctic Monitoring and Assessment Programme (AMAP). The GMA contains the most recent information on mercury emissions to air, releases in water and the transport of mercury in atmospheric and aquatic environments. The GMA data is either country specific or based on best estimates from global data and an understanding of the technology maturity of the countries.

The GMA will form an integral part of the work undertaken in Output 1.1.1 of this project. While the GMA contains vital baseline information, it does not contain detailed projections estimates for the coal sector, nor potential reductions potential. As such, the proposed project will build on and complement the GMA. Given that UNEP plays an important role in both the GMA and this proposed project, there is significant potential for knowledge sharing.

Baseline Projects – POPs Emissions

Stockholm Convention

The Stockholm Convention on Persistent Organic Pollutants (POPs) is a legally binding international environmental treaty to reduce or eliminate the production or use of POPs, which came into force in 2004. As noted earlier, the industrial sources listed in Annex D of the Minamata Convention are potential sources of non-intentional formations and emissions of POPs.

The implementation of the Stockholm Convention included a harmonized framework for the elaboration of comparable release inventories of the POPs included in Annex C of the Convention, as well as state-of-the-art guidelines on best available techniques and guidance on best environmental practices to restrict or eliminate production and use of POPs for the following topics:

- Waste incinerators;
- Cement kilns firing hazardous waste;
- Thermal processes in the metallurgical industry;
- Open burning of waste, including burning of landfill sites;
- Thermal processes in the metallurgical industry not included in Annex C Part II of the Stockholm Convention;
- Fossil fuel fired utility and industrial boilers.

Coal fired facilities form a major part of the utilities and industrial boilers listed at 6 above. Hence inclusion of dioxin emissions in this project is justified, and results in a project which addresses both mercury and POPs.

The guidance for the Stockholm Convention also includes a Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs under Article 5 of the Stockholm Convention on Persistent Organic Pollutants^[8]. This guidance includes default emission factors and example inventories, and has been used by a number of countries to develop initial estimates of POPs emissions. However, POPs formation in thermal processes is strongly affected by actual processing conditions and hence there are potentially significant uncertainties in emission factors. In recognition of these challenges the Toolkit was revised to provide emission factors for sources typical in developing regions, address gaps, and otherwise improve its usefulness and user friendliness. The guidance material and Toolkits will form crucial baseline information used for the proposed project.^[9]

3) the proposed alternative scenario with a description of outcomes and components of the project;

As illustrated in figure 1, the objective of this project is to demonstrate mercury and POPs emissions reduction potential from coal-fired power plants and industrial boilers in order to support governments in implementing control and reduction strategies for new and existing sources. To achieve this, the project will quantify potential future emissions of mercury and POPs from coal-fired power plants and industrial boilers for the current baseline scenario and for a range of development scenarios. This data will underline the benefits that will accrue from targeted international action embedded in the Paris Agreement targets, and the Stockholm and Minamata Conventions.

Any proposed project in the future will require close engagement with Ministries of Environment, Industry and Energy, utilities, users of industrial boilers, and technology providers. At a global level, this project will strengthen information exchange among stakeholders, using the Global Mercury Partnership and the existing industrial emissions platforms within the Partnership. A key output of this proposed project is the identification of opportunities for regional/global cooperation and synergies between countries working on these issues.

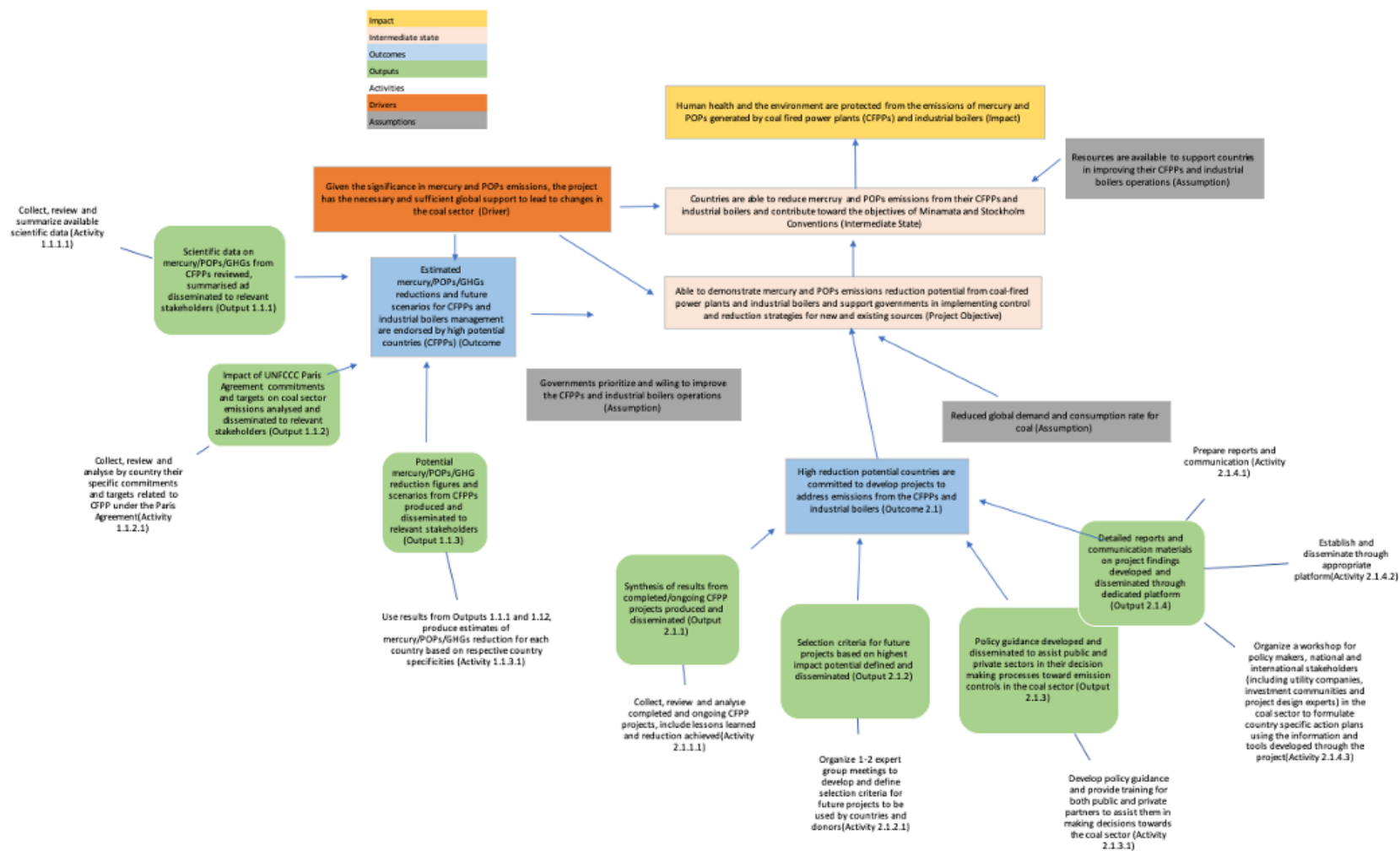


Figure 1: Theory of Change

Expected Outcomes

There is broad recognition that improvements to the coal sector will contribute to the objectives of the Minamata Convention through reduced mercury emissions. However, as outlined above, there have been limited projects actually demonstrating this potential to countries. Discussions at the Second Conference of the Parties (COP2) to the Minamata Convention recognised that to overcome the barrier on insufficient data availability, the first step is to collect existing strong scientific data to assess and demonstrate the reduction potential and future contribution of the coal sector to mercury emission reductions.

Through this proposed GEF project, ***potential*** mercury emission reduction will be estimated for coal-fired power plants and industrial boilers in the major emitting countries using a range of emission scenarios and assumptions.

The project will demonstrate the effect of Minamata Convention implementation on potential mercury emissions from coal fired power plants, and provide information on the repercussions of neglecting this large industrial source.

Brief Project Description

The project will be implemented through the below outlined components and outputs. The Macquarie University will be the main executing agency for the project.

Component 1: 1. Comprehensive coal sector analysis

Outcome 1.1: Estimated mercury/POPs/GHGs reductions and future scenarios for CFPPs and industrial boilers management are endorsed by high potential countries

The proposed project will draw on the best available information to assess the contribution of the coal sector to mercury and POPs emissions for future scenarios, and relate that to commitments that have been made under the Paris Agreement to reduce CO₂ emissions. As such, the outcome of this component will be improved data availability on the potential for mercury and POPs reduction which facilitates the development of appropriate national legislation and regulatory capacity in future projects.

Output 1.1.1: Scientific data on mercury/POPs/GHGs from CFPPs reviewed, summarised and disseminated to relevant stakeholders

Activity 1.1.1.1: Collect, review and summarize available scientific data

The quality of data available for coal sector emissions varies substantially across different countries. In the United States, Japan and some European countries the data is very reliable and has been reported for many years. Increasingly similar data is becoming publicly available for China. Data for other countries, however, is not as readily available and is less reliable.

The recent Global Mercury Assessment will provide initial country-wide emission estimates for the baseline case. These estimates will be complemented by additional information drawn from the scientific literature, government reports and through interviews with the network of participants in the Partnership for Mercury Control in Coal Combustion.

A similar approach will be used for baseline POPs emissions data. In some cases, countries have used the UNEP Toolkit to estimate emissions, but additional information is also available in USEPA reports, peer reviewed scientific publications and other sources.

In order to understand and quantify coal utilisation projects, this Output will review available information on country-specific projections of coal utilisation in coal-fired power plants and industrial boilers. High level data will be sourced from the IEA Clean Coal Centre, which publishes country specific projections for coal utilisation; from the regular series of analysis and forecasts made in the Market Report Series by the IEA; from other market projects; and, for more site-specific projections, from additional information drawn from the scientific literature, government reports and through interviews with the network of participants in the Partnership for Mercury Control in Coal Combustion. The aim will be to account for the majority of emissions (target 90%), and to extend the projections in line with the commitments that countries have made under the Paris Agreement (see Output 1.1.2)

Output 1.1.2: Impact of UNFCCC Paris Agreement commitments and targets on coal sector emissions analysed and disseminated to relevant stakeholders

Activity 1.1.2.1: Collect, review and analyse by country their specific commitments and targets related to CFPP under the Paris Agreement

The projections data reviewed and summarised under Output 1.1.1 will be complemented with data collected in the national commitment documents for the Paris Agreement. A key barrier in establishing accurate emissions reduction potential is the lack of coordination and data sharing between initiatives targeting mercury/POPs initiatives and those focused on GHG emissions.

By considering the coal sector commitments under the Paris Agreement, the proposed project will be able to establish more comprehensive baseline and projections data and as a result, produce more accurate figures for potential emissions reductions.

Output 1.1.3: Potential mercury/POPs/GHG reduction figures and scenarios from CFPPs produced and disseminated to relevant stakeholders

Activity 1.1.3.1: Use results from Outputs 1.1.1 and 1.1.2, produce estimates of mercury/POPs/GHGs reduction for each country based on respective country specificities

Based on the scientific data collected and analysed under Outputs 1.1.1 and 1.1.2, this output will use a range of scenarios to produce estimates of potential mercury/POPs/CO₂ reduction over the lifetime of a power plant. These scenarios will incorporate the impact of implementing measures included in the Minamata and Stockholm Conventions; for example, BAT/BEP approaches, power plant retrofitting, and the introduction of country specific emission limits. For coal-fired power plants, two relevant BEP options may be increasing plant efficiency or replacing coal with alternative fuel such as biomass. Using BAT may involve; coal washing; maximizing the co-benefits of controlling other pollutant gases and particles, while also including coal blending/switching, bromine salt addition, or prevention of Hg re-emission; and activated carbon injection for dedicated mercury removal. The data obtained from these measures will be combined with specific information on power plant life and closure to assess total potential future emissions. A similar approach will be used for POPs emissions.

The data produced by the Output will contribute to more informed decision making by a variety of stakeholders (government, private sector, donors, Conventions, etc.) and will ultimately, improve the efficiency of future interventions.

Component 2. Strategy for the coal sector's emissions reduction contribution to Stockholm and Minamata Conventions

Outcome 2.1 High reduction potential countries are committed to develop projects to address emissions from CFPPs and industrial boilers

The proposed project will utilise the findings of Component 1 and translate these into a selection criteria under Component 2. This selection criteria will be used to determine priority countries for future interventions in the coal sector. Information generated from the project will also be used by key decision makers in respective countries to guide their national strategies for implementation of the Minamata and Stockholm Conventions, as well as potentially, the Paris Agreement.

Output 2.1.1 Synthesis of results from completed/ongoing CFPP projects produced and disseminated

Activity: 2.1.1.1: Collect, review and analyse completed and ongoing CFPP projects, include lessons learned and reduction achieved

For the completed CFPP projects, the amount of mercury, POPs and GHGs reduced can serve as case studies for all future projects in the coal sector. Implementation strategies and lessons learned are important for global leaders and national stakeholders in key countries to understand and overcome common barriers and challenges in the sector. The synthesis of success project are important to demonstrate that reductions are possible and already made in the sector which can contribute significantly to global environmental benefits.

Output 2.1.2 Selection criteria for future projects based on highest impact potential defined and disseminated

Activity 2.1.2.1: organize 1-2 expert group meetings to develop and define selection criteria for future projects to be used by countries and donors

Building on the findings from Component 1, criteria for the selection of candidate countries with the highest potential for impact will be developed and defined. This selection criteria will serve to inform national decision making and potentially, a future GEF program targeting emissions of these toxic pollutants from the industrial sectors included in the Minamata and Stockholm Conventions.

Potential criteria to be considered could be countries with:

- Plans to significantly expand power generating capacity, with coal as the probable fuel of choice;
- Effective control of mercury and POPs emission as essential criteria for the success of the relevant UN Convention;
- Demonstrated interest in addressing the sector positively
- Baseline and projected mercury emissions, which could be reduced.

The finalised selection criteria will be confirmed during project implementation and will be based on available scientific data and the inputs of relevant project stakeholder. These criteria, based on the latest scientific data and compiled by leading experts on mercury emissions, will significantly improve the efficiency of funding allocation and reduce investment risks. This will not only benefit governments and donors through improved certainty but will also serve to attract increased private sector investment.

Using the final confirmed criteria, this Output will also identify an initial list of candidate countries, most likely to be in Africa, South East Asia and South America.

Output 2.1.3 Policy guidance developed and disseminated to assist public and private sectors in their decision making processes toward emission controls in the coal sector

Activity 2.1.3.1: Develop policy guidance and provide training for both public and private partners to assist them in making decisions towards the coal sector

The project will have the potential to generate a list of high potential countries to further reduce mercury and POPs emissions through their respective coal sector. In order to realize these emissions, it is crucial for both public and private partners in a given country to ensure that sufficient resources and technical options are available and reduction

initiatives are invested in the appropriate interventions. This decision making process requires a policy guidance which the project will generate as a recommendation to national stakeholders when evaluating the appropriate steps in approaching the coal sector.

Output 2.1.4: Detailed reports and communication materials on project findings developed and disseminated through dedicated platform.

Activity 2.1.4.1: Prepare reports and communication materials

Activity 2.1.4.2: Establish and disseminate through the Global Mercury Partnership

Activity 2.1.4.3: Organize a workshop for policy makers, national and international stakeholders (including utility companies, investment communities and project design experts) in the coal sector to formulate country specific action plans using the information and tools developed through the project

The primary objective of this proposed project is to inform decision-making with scientific data and pragmatic tools. This will include enhancing the learning uptake and ensuring continued stakeholder engagement at the national and international levels to support all components of the project. To this end, detailed reports and communication material on the results of the project will be prepared for project stakeholders, GEF Council Members and the public, and the data will be open access to all interested parties.

In addition, a closing workshop will be organized to focus on formulating action plans for specific countries using the information and tools developed through the project. Country, national and international stakeholder selection will be determined by the PSC based on: a) the priority analysis completed in component 1, and b) selection criteria developed through component 2, of the project.

To facilitate the dissemination of these materials and ensure their continued use and impact, a dedicated platform featuring specific resources, data and best practice will be developed. These will be drawn from the tasks described above, as well as the ongoing work of the UNEP Global Mercury Partnership. Such resources will include but are not limited to:

- Legal tools: industry codes, taxes/royalties, environmental standards, BAT/BEP case studies.
- National planning tools: baseline data gathering methods, checklists for legal authorities, institutional mapping, sample action plans.
- Technical tools: iPOG tool used for coal-fired power stations, best practice for air pollutant control technologies, mercury capture systems.
- Training tools: iLectures, training manuals.

The above will be complemented with existing UNEP tools including the Indicator Reporting Information System (IRIS). IRIS is an online national reporting system developed to facilitate reporting at all levels and simplify taking stock of the environment. The use of IRIS is linked to UNEP Live, an on-line knowledge management platform that makes global, regional and national data and knowledge accessible.

Component 3. Monitoring and Evaluation

Project implementation will be monitored and evaluated on an ongoing basis to ensure continued relevance and impact. Project monitoring and evaluation activities will be conducted line with the GEF and UNEP. A detailed description of the activities under this component is provided in Section 9: Monitoring and Evaluation.

4) alignment with GEF focal area and/or impact program strategies;

This proposed project's objective to demonstrate mercury emissions reductions potential from coal-fired power stations and industrial boilers directly contributes to the GEF-7 Chemicals and Waste Focal Area Strategy. The approach is closely aligned with the GEF-7 focus on sectoral investments rather than chemical-based approaches, and as such, offers a broader range of benefits and impacts. The proposed interventions will positively contribute to the Stockholm and Minamata Conventions, while also taking into consideration commitments under the Paris Agreement.

The following outcomes/outputs of the project will directly contribute to the GEF-7 objectives related to industrial emissions of mercury:

- Facilitating the development of national legislation and regulatory capacity through improved data;
- Introduction and use of best available techniques and best environmental practices to minimize and ultimately eliminate releases of unintentionally produced POPs and mercury from major source categories included in both the Stockholm and Minamata Conventions;
- Identification of priority countries for whom effective control of mercury and POPs emissions is essential for the success of the relevant UN Conventions. This priority list of countries will ensure that future projects focused on reducing mercury/POPs emissions initiatives are investing in the right countries and in the right types of interventions. This information is highly valuable for national decision makers, but also for the Conventions and multilateral donors such as the GEF to ensure that funds are invested in the most cost-effective manner possible.

Specifically, the proposed project will contribute to the following GEF-7 focal area objectives: CW-1-1: "Strengthen the sound management of industrial chemicals and their waste through better control, and reduction and/or elimination" and CW-EA: "Strengthen the capacity of countries to report to the Minamata and Stockholm Conventions."

The findings of this proposed project will also indirectly contribute to the other Focal Areas of the GEF and encourage multi-focal area projects. With improved data at hand, projects that would traditionally only focus on one environmental aspect (for example, improving the energy efficiency of industrial boilers) are more likely to expand their scope to also incorporate a broader range of environmental issues (such as also reducing mercury and/or POPs emissions). This outcome of the proposed project is aligned with the GEF-7 emphasis on multi-focal area projects and holistic interventions.

5) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing;

As outlined above, some work has been undertaken to better understand the contribution of the coal sector to mercury and POPs emissions. This information, however, has been limited to specific country studies or has focused on the more general topic of industrial emissions, rather than being coal specific. In this baseline scenario, studies would remain country-specific and fail to initiate a sectoral transformation at the scale that is required to significantly reduce mercury and POPs emissions.

Recognising these limitations, the proposed GEF project will build on the work, completed or underway, by the UNEP Global Mercury Partnership to address mercury emissions in the coal-fired power plant area by assessing and reducing emissions. The process optimization guidance (POG and iPOG) developed by the Coal Mercury Partnership has been showcased in Russia, China and South Africa and presents an ideal baseline for further study and dissemination of findings.

The project will utilise the studies conducted in Component 1 to develop selection criteria for interventions in those countries with the highest impact potential. By providing data-driven recommendations and criteria to drive investment in appropriate projects, this project will lead to cost-effective use of international financial resources.

The project will also benefit from complementary co-financing from a large number of partners in the Global Partnership drawn from academia, industry, instrument manufacturers, NGOs, and governments. The studies and initiatives managed by these partners will support the objectives of this project and ensure that there is no duplication of effort or lost opportunities for cooperation. The information on current activities in each of the participating countries collected by the UNEP Global Mercury Partnership will ensure that the Programme builds upon the work of the partners and contributes to complementing their planned interventions.

Macquarie University will provide in-kind co-financing in the form of staff time dedicated to this project. Professor Peter Nelson will have extensive involvement in the project and his direct salary and on-costs will be covered by the University. In addition, the University will be able to match funding received by the University from the GEF to conduct these projects at a rate of \$1 (MQ) for every \$4-5 (from the GEF).

6) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and

As designed, the Project is consistent with the GEF-7 Industrial Chemicals Program (Program 1) which seeks to eliminate or significantly reduce chemicals subject to better management by the Stockholm Convention on Persistent Pollutants and the Minamata Convention on Mercury. In line with these objectives, the proposed project will facilitate a broader program of work on industrial emissions of mercury which will result in:

- Support for the development of enabling environments and national legislation and regulatory capacity;
- Introduction and use of best available techniques and best environmental practices to minimize and ultimately eliminate releases of unintentionally produced POPs and mercury from major source categories included in both the Stockholm and Minamata Conventions. These include, but are not limited to, cement manufacturing, coal fired power plants, various metallurgical processes, and waste incineration.

This project's scope of work is limited to the preparation of a comprehensive sectoral analysis and strategic intervention framework and therefore, the associated global environmental benefits will be indirect in nature. As such, the figures provided for reductions in mercury and POPs reductions are based on best estimates.

7) innovativeness, sustainability and potential for scaling up.

The proposed project is highly ambitious and unique in its topical scope. With the combined comparative experience that the partners bring to this project, as well as the involvement and contributions made by other internationally recognized partners in the Global Mercury Partnership in Mercury from Coal Combustion, the project will ensure that the identified barriers are addressed through interventions that address challenges faced at the international, national and local levels.

The key challenge requiring an innovative approach is to develop scenarios which realistically account for coal market futures and predictive capabilities for the effects of process design and operating conditions on mercury emissions and POPs formation. An advantage of the previous work of the Partnership is that existing tools such as the POG and iPOG have already been developed to support the interventions and to generalize them for widespread application.

Sustainability:

The systematic documentation of the results and lessons learnt will ensure that countries not participating to the Programme will be able to easily identify the management and technical options better fitting their local conditions.

As part of the project's sustainability strategy, the knowledge management platform created under Output 2.1.4 will be embedded within the Global Mercury Partnership. This will ensure that the extensive knowledge of the Partnership is fully utilised and will ensure the sustainability of the platform.

Furthermore, as the findings of this project will form part of national commitments by Parties to the Stockholm and Minamata Conventions, there will be a higher likelihood of sustainability and application.

Scaling Up:

The ability to scale up and roll-out the findings of this project is at the core of the project's design. The outputs of Components 1 and 2 will be designed to enable decision-makers to scale up the findings and implement in the form of project interventions. Policy guidance provided through the project will assist in the decision making process for both the public and private sector. The availability of reliable emissions reduction potential will also help future interventions attract both public and private financing by reducing uncertainties around impact

[1] Food and Agriculture Organization (FAO) of the United Nations (2018). The State of World Fisheries and Aquaculture 2018 - Meeting the Sustainable Development Goals

[2] Giang, A. and N. E. Selin (2016). "Benefits of mercury controls for the United States." Proceedings of the National Academy of Sciences of the United States of America **113**(2): 286-291.

[3] UN Environment (2019). Global Mercury Assessment 2018. Geneva, Switzerland, UN Environment Programme, Chemicals and Health Branch: 60.

[4] IEA (2018). Coal 2018. Analysis and Forecasts to 2023.

[5] Altarawneh, M., et al. (2009). "Mechanisms for formation, chlorination, dechlorination and destruction of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs)." Progress in Energy and Combustion Science **35**(3): 245-274.

[6] Guerriero, E., et al. (2009). "Influence of Process Changes on PCDD/Fs Produced in an Iron Ore Sintering Plant." Environmental Engineering Science **26**(1): 71-80.

Quass, U., et al.(2000). "The European Dioxin Emission Inventory Stage II." Volume 1.
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.550.7096&rep=rep1&type=pdf>

Suzuki, K., et al. (2004). "De novo formation characteristics of dioxins in the dry zone of an iron ore sintering bed." Chemosphere **54**(1): 97-104.

[7] See <http://chm.pops.int/Implementation/BATandBEP/Overview/tabid/371/Default.aspx>, accessed 28th May 2019

[8] <http://toolkit.pops.int/> accessed 9th November 2018

[9] UNEP (2013). Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs under Article 5 of the Stockholm Convention, UN Environment: 445.

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

n/a (global project)

1c. Child Project?

If this is a child project under a program, describe how the components contribute to the overall program impact.

n/a

2. Stakeholders

Please provide the Stakeholder Engagement Plan or equivalent assessment.

The proposed project will be a collaborative effort between leading experts and organizations in the fields of mercury management. A summary of the project's stakeholder engagement plan is provided below:

Stakeholder	Role in Project Execution
UNEP	UNEP, as the GEF implementing agency, will manage the over project implementation and oversee the lead execution agency. In its implementation function, UNEP will also be responsible for monitoring and evaluation and will be a member of the Project Steering Committee.

<p>Global Mercury Partnerships</p> <p>The Global Mercury Partnerships^[1] currently consist of almost 200 partners, including government, industry, technology providers, IGOs, NGOs and academia. The leaders of relevant partnerships have also had extensive experience in similar projects of direct relevance to this programme and involving demonstration of mercury control approaches in developing countries.</p> <p>Partnership on Mercury Control in Coal Combustion.</p> <p>The partnerships are voluntary platforms to share knowledge and provide information on the sector and its needs</p>	<p>The expertise of the Global Mercury Partnerships and the existing tools it has prepared will form an important baseline for the proposed project. Members of the Partnership will regularly be consulted and will provide inputs and guidance to the project's outputs.</p>
IEA Clean Coal Centre	As Co-Chair of the Partnership on Mercury Control in Coal Combustions, the Centre will assist Macquarie University in executing the project by providing technical expertise, network and resources.
Macquarie University	As Co-Chair of the Partnership on Mercury Control in Coal Combustions, the University team will be the main executing agency on the project
Parties to the Conventions	National governments that are Parties to the relevant Conventions will be direct beneficiaries of this project's outputs. As such, they will be consulted during project implementation to ensure that the project outputs meet their needs and facilitate implementation of the Convention's requirements.
Convention Secretariats	The Secretariats of the relevant Conventions will be critical sources of information for this project and as such, will be consulted throughout project implementation.
Relevant Civil Society Groups	Civil society groups of the Global Mercury Partnerships will be consulted on relevant issues and will be invited to provide input to the project's outputs. Currently, 10 civil society groups are members of the Partnership on Mercury Control in Coal Combustion, including International POPs Elimination Network (IPEN) and Zero Mercury Working Group.

^[1] <http://web.unep.org/globalmercurypartnership/>

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement.

As above

Select what role civil society will play in the project:

Consulted only; Yes

Member of Advisory Body; Contractor;

Co-financier;

Member of project steering committee or equivalent decision-making body;

Executor or co-executor;

Other (Please explain)

n/a

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

There is increasing evidence that the health effects of toxic metals either differ in prevalence and/or are manifested differently in men and women. Though data is limited, the gendered health effects of mercury have been recorded. In particular, methylmercury bioaccumulated in fish and consumed by pregnant women may lead to neurodevelopmental problems in the developing foetus. Transplacental exposure is particularly dangerous, as the fetal brain is very sensitive, but synthetic chemicals may also be transferred from mother to child via breast milk. Furthermore, synthetic chemicals may disrupt the development of babies and young children even at low levels. For the fetus and neonate, exposures to environmental toxicants may result in a wide range of adverse health consequences across the life course and potentially be transmitted to the next generation. Therefore, in an effort to reduce mercury emissions in the coal sector, the project will indirectly contribute to achieving the Sustainable Development Goal (5) on gender equality and empowerment of women and girls. There will be no specific gender mainstreaming activities as part of the project as most activities will be research based, however, collection of disaggregated data by sex on the participation of stakeholders during meetings and consultations will be conducted.

Since the number of countries and the size of meetings cannot be determined at this time, no gender specific targets can be generated. However, the project will propose an assessment tool to estimate direct beneficiaries disaggregated by gender through consultation with a gender expert based on the size of the plants and surrounding communities. The gender expert will also provide advice on project activities to ensure that gender considerations are included.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?

No

Closing gender gaps in access to and control over natural resources;

Improving women's participation and decision making Yes

Generating socio-economic benefits or services or women

Will the project’s results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Elaborate on private sector engagement in the project, if any

Consultations with the private sector will be an integral aspect of the proposed project. Inputs from industry will be required to ensure that proposals put forward by the project are financially and technically feasible and appropriate for the coal sector. The Partnership on Mercury Control in Coal Combustions will be key forum for these consultations as nineteen industry representatives are already members. Where additional expertise or insights are required, the project can build on the private sector relationships already established within the broader Global Mercury Partnership and the extensive networks of other project partners such as the Clean Coal Centre and Macquarie University.

Looking beyond the scope of this proposed project, the outputs of this project will foster increased private sector engagement in mercury reduction initiatives by improving the data around reduction potentials. By reducing uncertainties and helping governments incorporate action plans for the coal sector in their national planning, this project will send a clear signal to the private sector of the required steps.

5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

The overall risk of this proposed project is low as detailed in the below table:

Risk	Rating	Mitigation Measures
Involvement Risk Lack of interest by key decision-makers to utilize analysis findings and selection criteria to tackle mercury/POPs emissions from the coal sector.	Low	The project's focus on communication materials and a knowledge platform will ensure that relevant decision-makers are aware of the project's findings. As Parties to the Minamata Convention have already committed to reduce mercury emission from key source categories, including the coal sector, this risk if limited uptake is assessed as low.
Insufficient Data Availability Lack of data results in inconclusive analyses and findings.	Low	The project is built on a strong baseline and will be implemented in close coordination with leading experts in the field. A review of available scientific data will be conducted under Output 1.1.1 and where information gaps are identified, the proposed project will rely on the extensive expertise of the Global Mercury Partnership to ensure that a valuable analysis is conducted.
Environmental and Social Risks Negative environmental and/or social impact of project activities. Negative impact of climate change on project activities.	Low	<p>The project's interventions have been assessed as low risk as they are limited to desktop studies and will not result in detrimental environmental and social impacts.</p> <p>In the unlikely scenario that environmental or social impacts are identified during project implementation, these will be discussed in the Project Steering Committee and appropriate mitigation measures will be adopted. The executing agency does have mechanisms which can address complaints should they arise during the project.</p> <p>Given the nature of the project activities, climate change is not expected to have any impact on project outputs.</p>
Political Risk Change in political priorities limits impact of project findings.	Low	Parties to the Minamata Convention have already committed to reduce mercury emission from key source categories, including the coal sector, and a significant shift in priorities is not expected. The project has, however, committed funding to communication materials and a knowledge platform to ensure that the project findings and implications for the coal sector are understood by the relevant governments.
Investment Risk The private sector is not willing to commit the required funds to reduce mercury/POPs emissions.	Medium	<p>While this does not pose a direct risk to this project, it could threaten the sustainability of the project's outcomes.</p> <p>The results of Outputs 1.1.3 and 2.1.1 will contribute to the mitigation of this risk by increasing the certainty of intervention results and consultations with the private sector throughout the project (through the Global Mercury Partnership) will also allow the project to address investment concerns at an early stage and incorporate these into the ultimate project findings.</p>
Coordination Risk Lack of coordination between project stakeholders hinders holistic intervention that targets mercury, POPs and GHG emissions.	Low	The project has been designed from the outset to consider these three environmental concerns and as such, has a strong emphasis on stakeholder engagement. This will be operationalised through the Global Mercury Partnership, but will also rely on the broad expertise and networks of UNEP.

COVID19 Risk Impact of the global pandemic delaying project activities	Low	Situation related to COVID19 is very dynamic and uncertain at the moment. However, based on the nature of the proposed project, impact of COVID19 on project activities will be very limited to none. The project may experience delays in gathering information as countries may be slower than usual in responding to requests and inquiries. In addition, country specific COVID19 measures in place may impact the timeliness of gathering materials. The project will adjust its timeline of activities based on the global pandemic and revise accordingly.
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6. Institutional Arrangement and Coordination

Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

As the GEF Implementing Agency, UNEP will be responsible for the overall project supervision, overseeing the progress through monitoring and evaluation of activities and through progress reports, including on technical issues and knowledge management. As host of the Global Mercury Partnership, UNEP will ensure that the proposed project is implemented in close alignment with related initiatives (see below for further detail).

Macquarie University will be the Executing Agency working in collaboration with the IEA Clean Coal Center. Macquarie University will manage the overall project budget, supervise project execution, and conduct the required monitoring missions.

GEF



UNEP (IA)



Macquarie University (EA) with
IEA Clean Coal Centre

(co-leads of the coal sector
under Global Mercury
Partnership)

Figure 2. Institutional Arrangement

To ensure close cooperation between key partners, a Project Steering Committee (PSC) will be established. The PSC will provide the required guidance and coordination for project implementation; all decisions made by the PSC will be made in accordance with the project document and GEF and UNEP guidance. The schedule of PSC meetings will be aligned with meetings of the Global Mercury Partnership to achieve cost efficiencies.

The proposed members of the PSC are outlined below and will be confirmed at the project inception workshop:

- UNEP
- IEA Clean Coal Centre
- Global Mercury Partnership

As executing agency, Macquarie University will act as secretary to the steering committee.

-

Coordination:

The critical role of the Global Mercury Partnership in the proposed project and close alignment with the Minamata Convention will ensure that knowledge sharing with related initiatives is an integral aspect of the proposed project.

Specifically, in addition to the initiatives outlined in the baseline section, the proposed project will also closely cooperate with the following related projects:

GEF-funded Minamata Initial Assessments (MIAs): The GEF has committed significant funding to support countries in the development of their MIAs; existing MIAs will be a key source of information for Output 1.1.1. The findings of this proposed project will also support future MIAs by providing critical baseline and projections information that will help countries set appropriate priorities and intervention areas.

Global Knowledge Management and Exchange of Programme Project Results Through Networking and Outreach Activities for the GEF GOLD Programme (GEF ID: 9697): the \$180 million GEF GOLD Programme spans eight countries and focuses on reducing mercury emissions from the artisanal gold-mining sector. At the global level, the programme is strongly focused on coordination and knowledge management. While the GOLD programme and this proposed project focus on mercury emissions from very different sectors, there is strong coordination potential on knowledge sharing and management, as well as expertise on mercury emissions potential. As UNEP acts as the implementing agency for both projects, close alignment will be ensured.

Global Best Practices on Emerging Chemical Policy Issues of Concern under the Strategic Approach to International Chemicals Management (SAICM) (GEF ID:9771): this UNEP project will develop tools and best practices for the management of chemicals of concern and includes a knowledge management platform focused on awareness raising and dissemination. The relevance of the SAICM project's outputs for this project will be explored and given that both projects share similar stakeholders, information sharing between the knowledge platform will be coordinated.

As described in the previous risk section, impact of COVID19 global pandemic on project activities will be limited to none. However, country specific measures in combating the virus may affect the timeliness of collecting scientific information to complete project activities. Therefore, the schedule and workplan for the project will be closely monitored, coordinated and further revised based on the actual situation in various countries during implementation.

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

The outputs of this proposed project will directly help countries understand and quantify their contributions to the objectives of the Minamata and Stockholm Conventions. As such, the project's findings will directly inform the NIPs and MIAs of Parties to these Conventions and lead to future investments in the reducing coal sector emissions.

This research based project does not directly contribute towards poverty alleviation but it is consistent with the Poverty Reduction Strategy Paper to improve measures for economic growth through reduction of harmful chemicals in the working environment.

The project will also contribute to the NCs of the UNFCCC by helping countries better understand the broader impact of their interventions on coal sector emissions. As there is strong encouragement for co-benefits of multiple environmental Conventions, it is wise to move beyond a silo focus on individual Convention obligations and focus on combined interventions to achieve maximum effectiveness with efficient use of resources.

8. Knowledge Management

Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.

Knowledge management will be key to the sustainability and scalability of this proposed project and as such, a stand-alone output has been dedicated to knowledge sharing. This output will create a knowledge management platform within the UNEP Global Mercury Partnership to disseminate the findings of this project, as well as other relevant materials to inform national decision making.

Key materials for inclusion in the platform include:

- Mercury/POPs reductions potential from the coal sector (Output 1.1.3)
- Country selection criteria (Output 2.1.2)
- POG and IPOG materials

- Scientific data and resources identified during review process of Output 1.1.1.

In addition, Knowledge Management for the Project will utilise UNEP tools including MAP-X to facilitate reporting at all levels and make it easier to take stock of the environment. Those responsible for collecting data, generating indicators and reporting on the state and trends of the environment will now be able to communicate information online - quickly and regularly - with all relevant stakeholders.

Government Ministries responsible for reporting on national, regional and global obligations can collect, analyze and publish quality assured information in a timely manner with MAP-X. As MAP-X enables the regular sharing and updating of data and indicators between Ministries/agencies, the same data can be used to report on different obligations. The Project will make use of the available mapping, search, visualization tools, to ensure project knowledge is captured and disseminated. The Project will also establish a Community of Practice under the UNEP Global Mercury Partnership, providing stakeholders a space to share ideas, data and knowledge, with and from other similar projects and initiatives, and ensure opportunities for networking building and communication through the use of technology and social media.

The Programme will also benefit from the Extractive Industries Hub currently under development in UNEP. Private sector involvement in the hub, especially from the mining industry, will ensure a very targeted dissemination of the outreach materials and lessons learnt from the project developed under Output 2.1.3.

9. Monitoring and Evaluation

Describe the budgeted M and E plan

Day to day monitoring of the project is the responsibility of the executing agency (EA). The EA will prepare a half yearly project report to ensure proper supervision by the IA.

In addition to this regular monitoring, the project will be reviewed annually at the Project Steering Committee meeting. In line with UNEP Evaluation and Policy and the GEF's Monitoring and Evaluation Policy the project will be subject to a Terminal Evaluation.

In-line with the with UNEP Evaluation Policy and the GEF Evaluation requirements, the project will be subject to an independent Terminal Evaluation. The Evaluation Office will be responsible for the Terminal Evaluation (TE) and will liaise with the project manager throughout the process.

The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. The project performance will be assessed against standard evaluation criteria using a six-point rating scheme. It will have two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP staff and implementing partners. The direct costs of the evaluation will be charged against the project evaluation budget. The TE will typically be initiated after the project's operational completion. If a follow-on phase of the project is envisaged, the timing of the evaluation will be discussed with the Evaluation Office to feed into the submission of the follow-on proposal.

The draft TE report will be sent by the Evaluation Office to project stakeholders for comment. Formal comments on the report will be shared by the Evaluation Office in an open and transparent manner. The final determination of project ratings will be made by the Evaluation Office when the report is finalised.

The evaluation report will be publicly disclosed and will be followed by a recommendation compliance process. The evaluation recommendations will be entered into a Recommendations Implementation Plan template by the Evaluation Office. Formal submission of the completed Recommendations Implementation Plan by the project manager is required within one month of its delivery to the project team. The Evaluation Office will monitor compliance with this plan every six months for a total period of 12 months from the finalisation of the Recommendations Implementation Plan.

The direct costs of reviews and evaluations will be charged against the project evaluation budget.

M&E activity	Purpose	Responsible	Budget	Timeframe
Inception workshop & report	Review of project activities, output and intended outcomes: detailed work planning	EAs	10,000	Within two months of project start
Project Steering Committee meetings	Review of progress against approved workplan and budget and help provide advice to the Project Manager to ensure project achieves desired outputs and outcomes; Provide guidance to ensure project objective remains valid; make needed changes or revisions of project	EAs	0	Steering committee meetings will be organized 3 times over the course of the project.
Quarterly financial reports	Assess that resources are being utilised optimally according to the approved workplan	EAs	0	31 January, 30 April, 31 July and 30 September
Half-yearly progress reports and annual Project Implementation Review	Progress and effectiveness review, including for GEF. Documentation of lessons learnt	EAs	0	31 January and 31 July
Project Implementation Report	Progress and effectiveness review, including for GEF. Documentation of lessons learnt	EAs / IA	0	31 July
Terminal report	Reviews effectiveness against implementation plan; Highlights technical outputs; Identifies lessons learned and likely design approaches for future projects; assesses likelihood of achieving design outcomes	EAs	0	1 month after the completion of technical activities
Terminal evaluation	Reviews effectiveness, efficiency and timeliness of project implementation, coordination mechanisms and outputs. Identifies lessons learned and likely remedial actions for future projects Highlights technical achievements and assesses against prevailing benchmarks	UNEP Evaluation Office	30,000	No later than 6 months after the completion of the technical activities
Financial audit	Reviews use of project funds against budget and assesses probity of expenditure and transactions	EAs	0	To be conducted no later than 6 months after completion of technical activities

Total M&E Cost	40,000	
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10. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

There are significant social and economic benefits at a national scale from installation of mercury emission controls. These benefits are in the form of prevented/decreased human exposure to mercury and subsequent reduced health risks and reduced environmental risks as a result of reduced emissions. These reduced risks are associated with economic gains. Demonstrating the co-benefit effects of reducing multiple pollutants simultaneously could be the impetus for countries of South East Asia, South America, and Africa to realize that they can afford to set legislation, that they will be able to achieve compliance, and that they can produce beneficial effects for the population. Beneficial effects of multi-pollutant control have been estimated in terms of prevented premature deaths, chronic bronchitis, nonfatal heart attacks, respiratory symptoms, aggravated asthma, and hospital and emergency room visits. All of the above adverse impacts result in economic losses.

11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification *

PIF	CEO Endorsement/Approval	MTR	TE
Low			
Measures to address identified risks and impacts			
Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.			



Identification	
Project Title	<i>Assessment of existing and future emissions reduction from the coal sector toward the implementation of the Minamata and Stockholm Conventions</i>
Managing Division	<i>Economy Division</i>
Type/Location	<i>Global/Normative</i>
Region	<i>N/A</i>
List Countries	<i>N/A</i>
Project Description	<i>The project aims to: a) understand mercury and POPs reduction potential from coal fired power plants and industrial boilers, b) identify high reduction potential countries and help them prepare to develop projects in addressing their respective emissions</i>
Relevant Subprogrammes	<i>N/A</i>
Estimated duration of project	<i>36 months</i>

Estimated cost of the project	USD\$594,000
Name of the UNEP project manager responsible	Mr. Ludovic Bernaudat
Funding Source(s)	GEF
Executing/Implementing partner(s)	Macquarie University (Sydney, Australia) and IEA Clean Coal Centre
SRIF submission version	N/A
Safeguard-related reports prepared so far <i>(Please attach the documents or provide the hyperlinks)</i>	<ul style="list-style-type: none"> · <i>Feasibility report []</i> · <i>Gender Action Plan []</i> · <i>Stakeholder Engagement Plan []</i> · <i>Safeguard risk assessment or impact assessment []</i> · <i>ES Management Plan or Framework []</i> · <i>Indigenous Peoples Plan []</i> · <i>Cultural Heritage Plan []</i> · <i>Others _____</i>



A. Summary of the Safeguards Risk Triggered

Safeguard Standards Triggered by the Project	Impact of Risk ^[1] (1-5)	Probability of Risk (1-5)	Significance of Risk (L, M, H) <i>Please refer to the matrix below</i>
SS 1: Biodiversity, Ecosystems and Sustainable Natural Resource Management	1	1	L
SS 2: Climate Change and Disaster Risks	1	1	L
SS 3: Pollution Prevention and Resource Efficiency	1	1	L
SS 4: Community Health, Safety and Security	1	1	L
SS 5: Cultural Heritage	1	1	L
SS 6: Displacement and Involuntary Resettlement	1	1	L
SS 7: Indigenous Peoples	1	1	L
SS 8: Labor and working conditions	1	1	L

B. ESS Risk Level[2] -

5	H	H	H	H	H
4	M	M	H	H	H
3	L	M	M	M	M
2	L	L	M	M	M
1	L	L	L	L	L
#	1	2	3	4	5

Refer to the UNEP ESSF (Chapter IV)
and the UNEP’s ESSF Guidelines.



Low risk X

Moderate risk

High risk

Additional information required



C. Development of ESS Review Note and Screening Decision

Prepared by

Name: Mr. Grace Halla Date: 24 October 2020

Screening review by

Name: Yunae Yi Date: 16 November 2020



Cleared[3]

D. Safeguard Review Summary (by the safeguard team)

The project is in the low risk category. However, due diligence on potential safeguard issues is recommended throughout the project) is recommended. UNEP ESSF guiding principles--resilience and sustainability; human rights, gender equality and women empowerment, accountability and leave no one behind--are still applicable for all UNEP projects. Project level grievance mechanism (if the government does not have such venue) should be established for any complaints to be handled swiftly at the project level.

E. Safeguard Recommendations (by the safeguard team)



- No specific safeguard action required



- Take Good Practice approach^[4]

- Carry out further assessments (e.g., site visits, experts' inputs, con: ☐ affected communities, etc.)

- Carry out impact assessments (by relevant experts) in the risk area ☐ and develop management framework/plan

- Consult Safeguards Advisor early during the full project developm ☐ phase

- Other _____



Screening checklist	Y/N/ Maybe	Justification for the response (please provide answers to each question)
Guiding Principles (these questions should be considered during the project development phase)		
GP1 Has the project analyzed and stated those who are interested and may be affected positively or negatively around the project activities, approaches or results?	Y	The project will make an effort to include any potentially affected stakeholders, in particular vulnerable and marginalized groups, including decision making processes that may affect them
GP2 Has the project identified and engaged vulnerable, marginalized people, including disabled people, through the informed, inclusive, transparent and equal manner on potential positive or negative implication of the proposed approach and their roles in the project implementation?	Maybe	The project has identified but not yet engaged vulnerable and marginalized people in the project development process
GP3 Have local communities or individuals raised human rights or gender equality concerns regarding the project (e.g. during the stakeholder engagement process, grievance processes, public statements)?	N	No issues have been raised during project development
GP4 Does the proposed project consider gender-balanced representation in the design and implementation?	Y	There will be no specific gender mainstreaming activities as part of the project as most activities will be research based, however, collection of disaggregated data by sex on the participation of stakeholders from both sexes during meetings and consultations will be conducted.
GP5 Did the proposed project analyze relevant gender issues and develop a gender responsive project approach?	Y	Please see response above
GP6 Does the project include a project-specific grievance redress mechanism? If yes, state the specific location of such information.	N	This is not necessary for a research based project
GP7 Will or did the project disclose project information, including the safeguard documents? If yes, please list all the webpages where the information is (or will be) disclosed.	N	This is to be decided during the inception workshop
GP8 Were the stakeholders (including affected communities) informed of the projects and grievance redress mechanism? If yes, describe how they were informed.	N	Only project partners who will be involved in the research are informed
GP9 Does the project consider potential negative impacts from short-term net gain to the local communities or countries at the risk of generating long-term social or economic burden? ^[5]	N	Not applicable for a research based project

GP10 Does the project consider potential partial economic benefits while excluding marginalized or vulnerable groups, including women in poverty?	N	Not applicable to research based project
Safeguard Standard 1: Biodiversity, Ecosystems and Sustainable Natural Resource Management		
<i>Would the project potentially involve or lead to:</i>		
1.1 conversion or degradation of habitats (including modified habitat, natural habitat and critical natural habitat), or losses and threats to biodiversity and/or ecosystems and ecosystem services?	N	No, the project focuses on the assessment of mercury and POPs reduction potential from coal fired power plants and industrial boilers, it will have no impact on natural habitat
1.2 adverse impacts specifically to habitats that are legally protected, officially proposed for protection, or recognized as protected by traditional local communities and/or authoritative sources (e.g. National Park, Nature Conservancy, Indigenous Community Conserved Area, (ICCA); etc.)?	N	The project will have no impact to natural habitat
1.3 conversion or degradation of habitats that are identified by authoritative sources for their high conservation and biodiversity value?	N	The project will not convert or degrade any habitats
1.4 activities that are not legally permitted or are inconsistent with any officially recognized management plans for the area?	N	No such activities are planned under the project
1.5 risks to endangered species (e.g. reduction, encroachment on habitat)?	N	The project poses no risks to endangered species
1.6 activities that may result in soil erosion, deterioration and/or land degradation?	N	The project will not result in soil erosion, deterioration and/or land degradation
1.7 reduced quality or quantity of ground water or water in rivers, ponds, lakes, other wetlands?	N	The project will not reduce quality or quantity of ground water or other water bodies
1.8 reforestation, plantation development and/or forest harvesting?	N	The project will not involve reforestation, plantation development and/or forest harvesting
1.9 support for agricultural production, animal/fish production and harvesting	N	The project will not involve agricultural production, animal/fish production and harvesting
1.10 introduction or utilization of any invasive alien species of flora and fauna, whether accidental or intentional?	N	The project will not involve introduction or utilization of any invasive alien species of flora and fauna
1.11 handling or utilization of genetically modified organisms?	N	The project will not handle or utilize genetically modified organisms
1.12 collection and utilization of genetic resources?	N	The project will not collect or utilize genetic resources
Safeguard Standard 2: Climate Change and Disaster Risks		
<i>Would the project potentially involve or lead to:</i>		

2.1 improving resilience against potential climate change impact beyond the project intervention period?	N	The project will not improve resilience against potential climate change impact
2.2 areas that are now or are projected to be subject to natural hazards such as extreme temperatures, earthquakes, extreme precipitation and flooding, landslides, droughts, severe winds, sea level rise, storm surges, tsunami or volcanic eruptions in the next 30 years?	N	The project will not involve areas that are now or are projected to be subject to natural hazards
2.3 outputs and outcomes sensitive or vulnerable to potential impacts of climate change (e.g. changes in precipitation, temperature, salinity, extreme events)?	N	The project will not lead to outputs and outcomes sensitive or vulnerable to potential impacts of climate change
2.4 local communities vulnerable to the impacts of climate change and disaster risks (e.g. considering level of exposure and adaptive capacity)?	N	The project will not involve local communities vulnerable to the impact of climate change and disaster risks
2.5 increases of greenhouse gas emissions, black carbon emissions or other drivers of climate change?	N	The project will not increase GHG emissions
2.6 Carbon sequestration and reduction of greenhouse emissions, resource-efficient and low carbon development, other measures for mitigating climate change	Y	The project will assess the projected emissions of GHGs from coal fired power plants
Safeguard Standard 3: Pollution Prevention and Resource Efficiency		
<i>Would the project potentially involve or lead to:</i>		
3.1 the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	N	The project will not release any pollutants to the environment
3.2 the generation of waste (both hazardous and non-hazardous)?	N	The project will not generate any waste
3.3 the manufacture, trade, release, and/or use of hazardous materials and/or chemicals?	N	The project will not manufacture, trade or release and/or use any hazardous materials and/or chemicals
3.4 the use of chemicals or materials subject to international bans or phase-outs? (e.g. DDT, PCBs and other chemicals listed in international conventions such as the Montreal Protocol , Minamata Convention , Basel Convention , Rotterdam Convention , Stockholm Convention)	N	The project will not use chemicals or materials subject to international bans or phase outs
3.5 the application of pesticides or fertilizers that may have a negative effect on the environment (including non-target species) or human health?	N	The project will not involve application of pesticides or fertilizers
3.6 significant consumption of energy, water, or other material inputs?	N	The project will not have significant consumption of energy, water, or other material inputs
Safeguard Standard 4: Community Health, Safety and Security		

<i>Would the project potentially involve or lead to:</i>		
4.1 the design, construction, operation and/or decommissioning of structural elements such as new buildings or structures (including those accessed by the public)?	N	The project will not involve the design, construction, operations and /or decommissioning of structure elements
4.2 air pollution, noise, vibration, traffic, physical hazards, water runoff?	N	The project will not lead to air pollution, noise, vibration, traffic, physical hazards nor water runoff
4.3 exposure to water-borne or other vector-borne diseases (e.g. temporary breeding habitats), communicable or noncommunicable diseases?	N	The project will not lead to exposure of waster borne or other vector borne diseases
4.4 adverse impacts on natural resources and/or ecosystem services relevant to the communities' health and safety (e.g. food, surface water purification, natural buffers from flooding)?	N	The project will not have adverse impacts on natural resources
4.5 transport, storage use and/or disposal of hazardous or dangerous materials (e.g. fuel, explosives, other chemicals that may cause an emergency event)?	N	The project will not transport, storage and/or dispose hazardous or dangerous materials
4.6 engagement of security personnel to support project activities (e.g. protection of property or personnel, patrolling of protected areas)?	N	The project will not engage security personnel
4.7 an influx of workers to the project area or security personnel (e.g. police, military, other)?	N	The project will not lead to an influx of workers to the project area
Safeguard Standard 5: Cultural Heritage		
<i>Would the project potentially involve or lead to:</i>		
5.1 activities adjacent to or within a Cultural Heritage site?	N	The project is not involved with cultural heritage sites
5.2 adverse impacts to sites, structures or objects with historical, cultural, artistic, traditional or religious values or to intangible forms of cultural heritage (e.g. knowledge, innovations, practices)?	N	The project does not have adverse impacts to sites, structures or objects with historical, cultural, artistic, traditional or religious values
5.3 utilization of Cultural Heritage for commercial or other purposes (e.g. use of objects, practices, traditional knowledge, tourism)?	N	The project does not utilize cultural heritage or commercial or other purposes
5.4 alterations to landscapes and natural features with cultural significance?	N	The project does not alter landscapes and natural features with cultural significance
5.5 significant land clearing, demolitions, excavations, flooding?	N	The project does not lead to significant land clearing, demolitions, excavations, flooding
5.6 identification and protection of cultural heritage sites or intangible forms of cultural heritage		
Safeguard Standard 6: Displacement and Involuntary Resettlement		
<i>Would the project potentially involve or lead to:</i>		

6.1 full or partial physical displacement or relocation of people (whether temporary or permanent)?	N	The project does not involve physical displacement or relocation of people
6.2 economic displacement (e.g. loss of assets or access to assets affecting for example crops, businesses, income generation sources)?	N	The project does not lead to economic displacement
6.2 involuntary restrictions on land/water use that deny a community the use of resources to which they have traditional or recognizable use rights?	N	The project will not lead to involuntary restrictions on land/water use
6.3 risk of forced evictions?	N	The project will have no risk of forced evictions
6.4 changes in land tenure arrangements, including communal and/or customary/traditional land tenure patterns (including temporary/permanent loss of land)?	N	The project will not lead to change in land tenure arrangements
Safeguard Standard 7: Indigenous Peoples		
<i>Would the project potentially involve or lead to:</i>		
7.1 areas where indigenous peoples are present or uncontacted or isolated indigenous peoples inhabit or where it is believed these peoples may inhabit?	N	The project will not involve indigenous people
7.2 activities located on lands and territories claimed by indigenous peoples?	N	The project will not involve activities located on lands and territories claimed by indigenous people
7.3 impacts to the human rights of indigenous peoples or to the lands, territories and resources claimed by them?	N	The project will not involve indigenous people
7.4 the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	N	The project will not involve indigenous people
7.5 adverse effects on the development priorities, decision making mechanisms, and forms of self-government of indigenous peoples as defined by them?	N	The project will not involve indigenous people
7.6 risks to the traditional livelihoods, physical and cultural survival of indigenous peoples?	N	The project will not involve indigenous people
7.7 impacts on the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	N	The project will not involve indigenous people
Safeguard Standard 8: Labor and working conditions		
8.1 Will the proposed project involve hiring or contracting project staff ?	Y	The project will hire approximately 6 project staff

<i>If the answer to 8.1 is yes, would the project potentially involve or lead to:</i>		
8.2 working conditions that do not meet national labour laws or international commitments (e.g. ILO conventions)?	N	The project will provide working conditions that meet national labor laws
8.3 the use of forced labor and child labor?	N	The project will not involve forced labor nor child labor
8.4 occupational health and safety risks (including violence and harassment)?	N	The project will not have any occupational health and safety risks
8.5 the increase of local or regional unemployment?	N	The project will not increase local or regional unemployment
8.6 suppliers of goods and services who may have high risk of significant safety issues related to their own workers?	N	The suppliers and services providers to the project will not have high risk of significant safety issues related to their own workers
8.7 unequal working opportunities and conditions for women and men	N	The project will not lead to unequal working opportunities and conditions for women and men

^[1] Refer to UNEP Environmental and Social Sustainability Framework (ESSF): Implementation Guidance Note to assign values to the Impact of Risk and the Probability of Risk to determine the overall significance of Risk (Low, Moderate or High).

^[2] **Low risk:** Negative impacts minimal or negligible: no further study or impact management required.

Moderate risk: Potential negative impacts, but limited in scale, not unprecedented or irreversible and generally limited to programme/project area; impacts amenable to management using standard mitigation measures; limited environmental or social analysis may be required to develop a Environmental and Social Management Plan (ESMP). Straightforward application of good practice may be sufficient without additional study.

High risk: Potential for significant negative impacts (e.g. irreversible, unprecedented, cumulative, significant stakeholder concerns); Environmental and Social Impact Assessment (ESIA) (or Strategic Environmental and Social Assessment (SESA)) including a full impact assessment may be required, followed by an effective comprehensive safeguard management plan.

^[3] This is signed only for the full projects latest by the PRC time.

^[4] Good practice approach: For most low-moderate risk projects, good practice approach may be sufficient. In that case, no separate management plan is necessary. Instead, the project document demonstrates safeguard management approach in the project activities, budget, risks management, stakeholder engagement or/and monitoring segments of the project document to avoid or minimize the identified potential risks without preparing a separate safeguard management plan.

^[5]For example, a project may consider investing in commercial shrimp farm by clearing the nearby mangrove forest to improve the livelihood of the coastal community. However, long term economic benefit from the shrimp farm may be significantly lower than the mangroves if we consider full costs factoring safety from storms, soil protection, water quality, biodiversity and so on.

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
Appendix 5 - Signed SRIF	CEO Endorsement ESS	

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Project Objective	Objective level Indicators	Baseline	Targets and Monitoring Milestones	Means of Verification	Assumptions & Risks	UNEP PoW link and reference to SDGs
<i>Demonstrate mercury and POPs emissions reduction potential from coal-fired power plants (CFPPs) and industrial boilers in order to support governments in implementing control and reduction strategies for new and existing sources</i>	<i>No. of mercury/POPs/GHG reduction and elimination projects/strategies (impact indicator 4.1)</i>	<i>Industrial sources account for 55% of the total Hg emissions</i>	<i>Complete and comprehensive data and case studies (at least 10) lead to the endorsement of high potential countries (at least 3) to commit to the development of future projects</i>	<i>Reporting under Article 8 Minamata Convention, UNEP Global Mercury Partnerships in the coal sector, UNEP Global Mercury Assessment (GMA), Stockholm Convention</i>	<i>Risk: Lack of interest by key decision-makers to utilize analysis findings and selection criteria to tackle mercury/POPs emissions from the coal sector</i>	<i>Subprogramme 5: chemical, waste and air quality</i>
		<i>Many countries continue in investing or plan to invest in CFPP in the future</i>				<i>SDG3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</i> <i>SDG 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout</i>

						their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment
Component 1: Comprehensive coal sectoral analysis						
Outcomes	Outcome Indicators	Baseline	Targets and Monitoring Milestones	Means of Verification	Assumptions & Risks	UNEP PoW link and reference to SDGs
<i>Outcome 1.1: Estimated mercury/POPs/GHGs reductions and future scenarios for CFPPs and industrial boilers management are endorsed by high potential countries</i>	<i>No. of countries endorsing the results of emissions reduction potential and future scenarios (impact indicator 3.2)</i>	<i>Best available information on coal sector contribution to Hg and POPs emission</i>	TARGET: <i>Countries endorsing the results of emissions reduction potential and future scenarios: 5</i>	<i>Paris agreements commitments</i>	<i>Assumption: Countries prioritize coal sector for mercury/POPs reductions</i>	<i>SAME AS ABOVE</i>

					<i>Risk: Change in political priorities limits impact of project findings</i>	
Outputs	Output Indicators	Baseline	Targets and Monitoring Milestones	Means of Verification	Assumptions & Risks	UNEP PoW link and reference to SDGs
<i>Output 1.1.1: Scientific data on mercury/POPs/GHGs from CFPPs reviewed, summarised and disseminated to relevant stakeholders</i>	<i>No. technical publications reviewed (Activity 1.1.1.1) (impact indicator 9.1)</i>	<i>Information on country-specific projections of coal utilisation in coal-fired power plants and industrial boilers.</i>	TARGET: Technical publications reviewed: 10 Stakeholders with access to scientific data: 20	<i>Monitoring reports</i>	<i>Assumptions: qualitative data on emissions is available for analysis</i>	SAME AS ABOVE
	<i>No. of beneficiaries who had access to the scientific data (Activity 1.1.1.1) (impact indicator 10.1)</i>	<i>Initial country-wide emissions estimates</i>		<i>GMA 2019 estimates, literature, USEPA reports, UNEP toolkit, IEA</i>	<i>Risk: Lack of data results in inconclusive analyses and findings</i>	
					<i>Assumption: Quality of data varies across countries</i>	

Outcomes	Outcome indicator	Baseline	Targets and Monitoring Milestones	Means of Verification	Assumptions & Risks	UNEP PoW link and reference to SDGs
<i>Outcome 2.1: High reduction potential countries are committed to develop projects to address emissions from CFPPs and industrial boilers</i>	<i>No. of high reduction potential countries committed to develop future projects in coal sector (impact indicator 3.2)</i>	<i>Findings in component 1</i>	TARGET: <i>No. of countries committed to develop projects: 3</i>	<i>Minamata and Stockholm Conventions and Paris Agreement requirements</i>	<i>Risk: Lack of coordination between project stakeholders</i>	<i>SAME AS ABOVE</i>
Outputs	Output Indicators	Baseline	Targets and Monitoring Milestones	Means of Verification	Assumptions & Risks	UNEP PoW link and reference to SDGs
<i>Output 2.1.1: Synthesis of results from completed/ongoing CFPP projects produced and disseminated</i>	<i>No. of projects/reports reviewed (Activity 2.1.1.1) (impact indicator 9.1). No. of stakeholders with access to the synthesis of results (impact indicator 10.1)</i>	<i>Minamata and Stockholm Conventions requirements analysis</i>	TARGET: <i>No. of projects/reports reviewed: 10</i> <i>No. of stakeholders with access to results: 20</i>	<i>Monitoring reports, synthesis report</i>	<i>Risk: Lack of data results in inconclusive analysis and findings</i> <i>Assumption: Countries collaborate in sharing and finding data</i>	<i>SAME AS ABOVE</i>
<i>Output 2.1.2 Selection criteria for future projects based on highest impact potential defined and disseminated</i>	<i>No. of selection criteria for candidate countries (Activity 2.1.2.1) (impact indicator 4.1)</i>	<i>Available scientific data from countries</i>	TARGET: <i>No. of criterias defined: 5</i>	<i>Monitoring reports</i>		<i>SAME AS ABOVE</i>

Output 2.1.3 Policy guidance developed and disseminated to assist public and private sectors in their decision making processes toward emission controls in the coal sector	Availability of policy guidance (Activity 2.1.3.1) (impact indicator 4.1). No. of stakeholders reached (impact indicator 8.2)	Weak policy guidance exists	TARGET: Policy guidance produced: 1 No. of public and private stakeholders with access to policy guidance: 20 (at least 1/3 being women)	Monitoring reports, survey from stakeholders	Risk: Lack of coordination between project stakeholders.	SAME AS ABOVE
Output 2.1.4 Detailed reports and communication materials on project findings developed and disseminated through dedicated platform	No. of outreach materials produced (impact indicator 8.1); No. of stakeholders reached (impact indicator 8.2) (Activity 2.1.4.1, 2.1.4.2, 2.1.4.3)	Existing tools, ITIS, UNEP live	TARGET: Outreach materials produced: 1 Stakeholders reached: 20 (at least 1/3 being women)	workshop reports, information dissemination materials	Assumption: countries prioritize the coal sector and willing to reduce emissions	SAME AS ABOVE

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

n/a

ANNEX C: Status of Utilization of Project Preparation Grant (PPG). (Provide detailed funding amount of the PPG activities financing status in the table below:

<i>Project Preparation Activities Implemented</i>	<i>GETF/LDCF/SCCF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent Todate</i>	<i>Amount Committed</i>
Contract to Macquarie University	16,000	16,000	0
Consultants	16,000	16,000	0
Total	32,000	32,000	0

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/CBIT Trust Funds or to your Agency (and/or revolving fund that will be set up)

n/a

ANNEX E: Project Map(s) and Coordinates

Please attach the geographical location of the project area, if possible.

n/a (global project)

ANNEX F: Project Budget Table

Please attach a project budget table.

		Outcome 1	Outcome 2	Outcome 3 (M&E)	PMC	Total
US\$	US\$	US\$	US\$	US\$	US\$	US\$

PROJECT PERSONNEL COMPONENT						
1100	Project Personnel					
1101	Project Manager / Technical expert	30,000	30,000			60,000
1102	Project Assistant	20,000	20,000			40,000
1199	Sub-Total	50,000	50,000	0	0	100,000
1200	Consultants					0
1201	Communications Consultant		32,500			32,500
1202	Coal Sector Technical Consultant	15,000	15,000			30,000
1203	Policy Consultant		15,000			15,000
1204	Knowledge Management Consultant		32,500			32,500
1205	Gender Expert	5,000	5,000			10,000
1299	Sub-Total	20,000	100,000	0	0	120,000
1300	Administrative support					0
1301	Macquarie University Administration Support				35,000	35,000
1399	Sub-Total	0	0	0	35,000	35,000
1600	Travel on official business					0
1601	Travel for inception workshop	30,000				30,000
1602	Travel for first PSC meeting/expert group meeting	30,000				30,000
1603	Travel for second PSC meeting		30,000			30,000
1604	Travel for third PSC meeting/final workshop		30,000			30,000
1699	Sub-Total	60,000	60,000	0	0	120,000
1999	Component Total	130,000	210,000	0	35,000	375,000
SUB-CONTRACT COMPONENT						0

2100	Subcontract (UN organization)					0
2199	Sub-Total					0
2200	Sub-contracts (SSFA, PCA, non-UN)					0
2201	Clean Coal Center	45,000			9,000	54,000
2299	Sub-total	45,000	0	0	9,000	54,000
2999	Component Total	45,000	0	0	9,000	54,000
TRAINING COMPONENT						0
3200	Group training (field trips, WS, etc.)					0
3299	Sub-Total					0
3300	Meetings/conferences					0
3301	Inception Workshop			10,000		10,000
3302	First project steering committee meeting/expert group meeting	30,000				30,000
3303	Second project steering committee meeting		30,000			30,000
3304	Last project steering committee meeting/final workshop		30,000			30,000
3399	Sub-Total	30,000	60,000	10,000	0	100,000
3999	Component Total	30,000	60,000	10,000	0	100,000
EQUIPMENT & PREMISES COMPONENT						0
4100	Expendable equipment (under \$1,500)					0
4101	Office supplies (computers or software)		5,000			5,000
4102	Local transportation and fuel					0
4199	Sub-Total	0	5,000	0	0	5,000
4999	Component Total	0	5,000	0	0	5,000

MISCELLANEOUS COMPONENT						0
5200	Reporting costs (publications, maps)					0
5201	Knowledge Management/Communication Pieces		20,000			20,000
5299	Sub-Total	0	20,000	0	0	20,000
5300	Sundry (communications, postage, etc)					0
5301	Phone, postage, freight, international bank transfers					0
5399	Sub-Total					0
5500	Evaluation					0
5501	Final Evaluation			30,000		30,000
5502	Audit				10,000	10,000
5599	Sub-Total	0	0	30,000	10,000	40,000
5999	Component Total	0	20,000	30,000	10,000	60,000
TOTAL		205,000	295,000	40,000	54,000	594,000