



## **Part I: Project Information**

### **GEF ID**

10864

### **Project Type**

FSP

### **Type of Trust Fund**

GET

### **CBIT/NGI**

CBIT **No**

NGI **No**

### **Project Title**

Sustainable Mercury Management in Non-ferrous Metal Industry

### **Countries**

China

### **Agency(ies)**

World Bank

### **Other Executing Partner(s)**

Foreign Environmental Cooperation Center, Ministry of Ecology and Environment, China

### **Executing Partner Type**

Government

### **GEF Focal Area**

Chemicals and Waste

### **Sector**

### **Taxonomy**

Civil Society, Stakeholders, Focal Areas, Chemicals and Waste, Mercury, Non Ferrous Metals Production, Best Available Technology / Best Environmental Practices, Industrial Emissions, Emissions, Influencing

models, Strengthen institutional capacity and decision-making, Transform policy and regulatory environments, Demonstrate innovative approaches, Beneficiaries, Private Sector, Large corporations, Capital providers, Type of Engagement, Information Dissemination, Consultation, Academia, Trade Unions and Workers Unions, Gender Equality, Gender Mainstreaming, Sex-disaggregated indicators, Capacity, Knowledge and Research, Innovation, Capacity Development, Knowledge Generation

**Rio Markers**

**Climate Change Mitigation**

No Contribution 0

**Climate Change Adaptation**

No Contribution 0

**Biodiversity**

No Contribution 0

**Land Degradation**

No Contribution 0

**Submission Date**

12/8/2022

**Expected Implementation Start**

6/1/2023

**Expected Completion Date**

5/31/2029

**Duration**

72In Months

**Agency Fee(\$)**

1,800,000.00

**A. FOCAL/NON-FOCAL AREA ELEMENTS**

<b>Objectives/Programs</b>	<b>Focal Area Outcomes</b>	<b>Trust Fund</b>	<b>GEF Amount(\$)</b>	<b>Co-Fin Amount(\$)</b>
CW-1-1	Strengthen the sound management of industrial chemicals and their waste through better control, and reduction and/or elimination	GET	20,300,000.00	140,000,000.00
<b>Total Project Cost(\$)</b>			<b>20,300,000.00</b>	<b>140,000,000.00</b>

## **B. Project description summary**

### **Project Objective**

Project Objective: To demonstrate best available techniques and best environmental practices, and strengthen the regulatory framework for mercury management and reduction in the non-ferrous metal industry.

Project Component	Component Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
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Project Component	Component Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
1. Strengthen Regulatory Framework, Knowledge Dissemination and Promotion of Sector Wide Replication	Technical Assistance	<p>Strengthened Regulatory framework for sustainable mercury reduction in non-ferrous metal industry</p> <p>Enhanced capacity and awareness for mercury management in the sector</p> <p>Raised awareness of environmental risk prevention and control of mercury and Convention implementation in non-ferrous metal smelting sector leading to greater oversight and industry compliance</p>	<p>- Four standards, three technical guidelines, and one management plan (see subcomponent 1.1 for details)</p> <p>- The environmental and social safeguard assessment reports for 4 demonstration enterprises</p> <p>- A replication plan for scaling-up BAT/BEP implementation</p> <p>- At least 1000 participants join the training workshops (of which 15 percent are female)</p> <p>- Implementation plan of replication plan for five enterprises</p> <p>- Other dissemination</p>	GET	7,235,000.00	24,915,000.00

Project Component	Component Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
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n materials  
produced  
including  
brochures  
and videos

Project Component	Component Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
2. Demonstration of mercury emission control and recovery technology	Investment	Reduction of mercury emission and release through demonstration of BAT/BEP in non-ferrous sector	<p>- Demonstration of BAT/BEP technologies for mercury reduction in at least 4 selected enterprises while minimizing climate impact and promoting circular economy</p> <p>-Verified yearly emission reduction of mercury from demonstration enterprises</p> <p>- Verified yearly mercury recycled amount from wastes from demonstration enterprises</p> <p>- Enterprise-level BAT/BEP application manuals</p> <p>-Online monitoring equipment for gaseous mercury installed for</p>	GET	12,000,000.00	108,000,000.00



Project Component	Component Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
			<p>at least one demonstration enterprise</p> <p>-Synergized emission reduction co-benefit evaluated for GHG, conventional pollutants, and mercury for all demonstration enterprises</p> <p>-Energy savings opportunities identified for all demonstration enterprises.</p>			
3. Project management (Monitoring, Evaluation, Knowledge, and Learning)	Technical Assistance	Project monitoring, evaluation and knowledge products produced and made available.	- project monitoring, reporting, and evaluation, including knowledge projects and semiannual report and annual report of project progress, project completion report;	GET	100,000.00	
Sub Total (\$)					19,335,000.00	132,915,000.00

**Project Management Cost (PMC)**

GET	965,000.00	7,085,000.00
<b>Sub Total(\$)</b>	<b>965,000.00</b>	<b>7,085,000.00</b>
<b>Total Project Cost(\$)</b>	<b>20,300,000.00</b>	<b>140,000,000.00</b>

**Please provide justification**

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

<b>Sources of Co-financing</b>	<b>Name of Co-financier</b>	<b>Type of Co-financing</b>	<b>Investment Mobilized</b>	<b>Amount(\$)</b>
Beneficiaries	FECO / Pilot participating enterprises	Other	Investment mobilized	137,900,000.00
Recipient Country Government	FECO	In-kind	Recurrent expenditures	600,000.00
Recipient Country Government	Ecology and Environment Departments of selected provinces	In-kind	Recurrent expenditures	1,500,000.00
<b>Total Co-Financing(\$)</b>				<b>140,000,000.00</b>

**Describe how any "Investment Mobilized" was identified**

It is anticipated that four demonstration enterprises participating in the project will provide investment mobilized of nearly \$138 million. The demonstration enterprises will be selected through a transparent and open call for proposals which includes as a key criterion the degree of commitment to invest own funds in co-financing of the demonstration. Please note that all co-financing is documented in the letter provided by the FECO confirms the total co-financing commitment.

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(\$)	Total(\$)
World Bank	GE T	China	Chemicals and Waste	Mercury	20,300,000	1,800,000	22,100,000.00
Total Grant Resources(\$)					20,300,000.00	1,800,000.00	22,100,000.00

**E. Non Grant Instrument**

NON-GRANT INSTRUMENT at CEO Endorsement

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Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount (\$)

PPG Agency Fee (\$)

Agenc y	Trust Fund	Country	Foca l Area	Programmin g of Funds	Amount(\$)	Fee(\$ )	Total(\$ )
Total Project Costs(\$)					0.00	0.00	0.00

## Core Indicators

### Indicator 9 Chemicals of global concern and their waste reduced

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
90.00	110.00	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)
90.00	110.00		

### 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)
	1		

### 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)
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### Indicator 9.6 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)
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**Indicator 9.7 Highly Hazardous Pesticides eliminated**

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 9.8 Avoided residual plastic waste**

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 11 People benefiting from GEF-financed investments**

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
<b>Female</b>	500,000	50,000		
<b>Male</b>	500,000	50,000		
<b>Total</b>	1000000	100000	0	0

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

The project is expected to lead to significant regulatory strengthening and to direct reduction of mercury releases of 110 tons per year through enhanced removal and recovery in four pilot enterprises, as well as to promotion of replication industry and country-wide, leading to even greater impact through scale up. Two types of beneficiaries can be identified: the populations whose exposure is estimated to be reduced by the project and the project stakeholders and participants who benefit from capacity development under the project. Regarding exposure reduction, mercury and its compounds are global contaminants. When they are emitted from a point source such as a non-ferrous smelter, they (particularly elemental Hg) can be stable in the atmosphere for months before being removed by wet or dry deposition. The project beneficiaries are therefore, literally, the world population in general. Beneficiaries are also the populations that live and work close to the main source of emissions. These include the workers at the participating enterprises, assumed to directly benefit from mercury emissions reductions at these enterprises. An estimate based on four factories with an average of 2,500 workers, of which 15 percent are female, leads to 18,000 beneficiaries, of which 2,700 are women. Considering the potential broader impact on the



general public living within a distance where environmental levels of mercury may be directly affected by the point sources addressed by the project, the direct beneficiaries can be roughly estimated to be 100,000, of which 50 percent are female.

## Part II. Project Justification

### 1b. Project Map and Coordinates

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

Geo-coordinates: 35.0671° N, 112.6027° E



### 2. Stakeholders

Please provide the Stakeholder Engagement Plan or equivalent assessment.

A Stakeholder Engagement Framework was prepared as part of project preparation

The SEF plans the stakeholder engagement for two types of activities (physical and technical assistance), which analyses and identifies the needs of major stakeholders (including vulnerable groups), develops an information disclosure and consultation plan, defines resource arrangements, and develops a GRM. The following key stakeholders are identified.

### **Project Workers:**

**Direct workers:** Direct workers refer to personnel who are directly employed by the project proponent and the project implementing agency who specialize in project-related work. Direct workers mainly include workers during the operation period of the subproject. Workers may be affected by the OHS caused by the project, especially the technical changes and equipment changes brought about by the transformation of the steel production line.

**Contracted workers:** Contract workers refer to workers who are hired by a third party to perform core functions related to the project, regardless of their working location. Contract workers include contract workers during the construction period of investment subprojects, and workers dispatched by third-party companies during the operation period. The normal work of contractor workers can ensure the smooth construction of the project; the normal work of dispatched workers during the operation period can ensure the smooth operation of the project. However, contractor workers and third-party dispatched workers may be affected by the working conditions, OHS brought about by the project.

**Primary supply workers:** Primary supply workers refer to personnel employed by the main suppliers of the borrowing country. Primary supply workers include suppliers of materials and equipment, their normal work guarantees the supply of core raw materials or equipment for the project. However, these workers may be exposed to the potential risks of serious safety issues brought about by the project.

### **Civil society and the public:**

**Residents of surrounding communities:** Residents in the surrounding communities of the subproject, including residents of ethnic minority communities. Their support is the basis for the smooth progress of the project. However, the construction and operation process may be affected by noise, dust, waste gas, wastewater, construction camps, etc., as well as fire, explosion, chemical leakage, and road traffic safety.

**The public:** The public is the beneficiary of the project. This project is expected to bring multiple benefits to the global environment. The project will contribute to the reduction of mercury emission and release in China's non-ferrous industry and can reduce human health problems caused by mercury. It is not only beneficial to the workers in the industry, but also has positive benefits to the people living around the industry's production facilities.

### **Government departments:**

**Ministry of Ecology and Environment (MEE):** MEE, as the administrative authority on environmental protection, is designated by the State Council as the core agency for coordination of all mercury related activities in China and the focal point for the implementation of the MC in China. MEE is national implementing agency for this project. The existing inter-ministerial National Coordination Group (NCG) for Implementation of the MC led by MEE and comprises of 17 ministries will provide overall guidance and coordination to facilitate project implementation and promote adoption of national-level regulations and guidelines.

**The Foreign Environmental Cooperation Center (FECO):** The MEE has assigned FECO as the domestic implementing agency of this project. FECO has set up a project team for the implementation of this project. Based on agreed annual implementation plans, FECO will manage and supervise the implementation of all project activities. Through an implementation agreement, FECO will cooperate closely with Departments of Environmental Protection (DEPs) of the provinces where the demonstration enterprises are located to implement project activities at the local level.

**Ministry of Finance (MOF):** The Ministry of Finance is the liaison unit of the GEF in China and is responsible for the review, approval and supervision of all activities funded by the Fund in China. In

addition to being a member of the National Coordination Group, the Ministry of Finance will also manage the designated accounts of this project and supervise various payments.

**Local governments:** Local governments are mandated to enforce regulations and compulsory standards under the technical guidance issued by the line ministries. Local governments will be involved to identify gaps and needs of capacity building.

### **Social groups**

**Community neighbourhood committee:** Responsible for the organization and coordination of community work, etc. During the construction and operation of the project, assist the project management party to hold meetings for community residents, and act as a bridge to communicate the concerns and demands of community residents to the project management party or relevant government departments in a timely manner.

**Women's Federation:** The Women's Federation is mainly responsible for publicizing relevant laws and regulations; promote legal education in the community; safeguarding the legal rights of women and children in accordance with the law; strengthen the construction of women's organizations in the community; carefully listen to the suggestions and requirements of organizations at all levels on the work of the women's federation, and improve women's work; receive and accept letters and visits from women and help with psychological guidance. During the construction and operation of the project, the Women's Federation pays attention to the project's impact on women and protects women's rights and interests through investigations and seminars.

**Disabled Persons' Federation:** Protect the rights and interests of the disabled. During the construction and operation of the project, the Disabled Persons' Federation pays attention to the impact of the project on the disabled through investigations and seminars, and protects the rights and interests of the disabled.

### **Design & consulting firms and contractors**

**Industries associations:** China Non-ferrous Metal Industry Association is the platform of the non-ferrous metal smelting plants, which will provide technical and policy advice to the plants and will help promote implementation and replication of BAT/BEP demonstration, revisions and adoption of the relevant regulations and guidelines, and help organize and provide training, capacity-building and knowledge dissemination activities. They will also help recommend the successfully piloted technologies and practices to be certified by the relevant Chinese authorities and MC to be BAT/BEP.

**Design & consulting firms:** Carry out the overall design for the sub-projects before the implementation of the project. In the design of the project, it is necessary to consider the needs of various stakeholders, and pay attention to the risks and impacts of the environment and society. The design firm understands the needs of various stakeholders through various forms of participation activities such as surveys, seminars, seminars, interviews, etc., and optimizes the project design on this basis.

**Contractors:** This project does not involve civil engineering. Therefore, the contractor is mainly an equipment installation contractor who is mainly responsible for the installation of project equipment. The contractor shall implement policies and systems in terms of labour management, working conditions, and OHS in accordance with the requirements of the enterprise and project operator.

### **Vulnerable groups**

Vulnerable groups of the project may include:

- ? Contracted workers and primary supply workers involved in the construction and operation of the project;
- ? Vulnerable groups among residents in the surrounding communities;
- ? Ethnic minority communities.

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

**Table 5?3 Basic Contents of Project Public Participation Mechanism**

Applicable Activities	Stage	Content of Public Participation	Possible Method	Responsible Unit	Time
Technical assistance	Preparation Phase	? Collect inquiries and recommendations from relevant experts and institutions regarding posted job postings for technical assistance experts or teams.	? FECO webpage ? Recruitment agency website or relevant platform ? Published phone number or email address, etc.	? FECO ? Recruitment agency (if applicable)	? TA specialist and agency recruitment process
	Research stage	? Listen to the opinions of the public, downstream enterprises or institutions on the first draft of relevant research results.	? FECO webpage or ? Expert review meeting or ? Other information disclosure channels	? FECO ? Technical assistance expert team	? After the first draft is completed
	Review stage	? The final draft of the published research results collects feedback from society and downstream enterprises.	? FECO webpage or ? Reports or ? Other information disclosure channels	? FECO	? After the final draft is completed

Applicable Activities	Stage	Content of Public Participation	Possible Method	Responsible Unit	Time
Construction: equipment upgrade and procurement, as well as related supporting facilities construction or capacity expansion	Preparation stage	? Conduct public participation within the enterprise and collect employee opinions on the feasibility study and design of upcoming or ongoing projects. Based on the comments collected, the design is updated and feedback is given to employees.	? Enterprise website; ? Enterprise information bulletin board ? Enterprise public account; ? WeChat group, QQ group ? Trade union, factory manager mailbox ? Other information disclosure channels	? Project company	? The design stage of the project, and the earlier the better

Applicable Activities	Stage	Content of Public Participation	Possible Method	Responsible Unit	Time
		<p>Conduct public participation in other project-related assessments, including:</p> <p>? Enterprise Environmental and Social Audit or Impact Assessment Report and the corresponding <i>Environmental and Social Management Plan (ESMP)</i></p> <p>? If immigrant issues are involved, publicize the <i>Immigrant Resettlement Plan</i></p> <p>? If the project is located in an ethnic minority area, publicize the <i>Minority Development Plan</i></p> <p>? Publicity Project <i>Gender Action Plan</i></p>	<p>? Questionnaire</p> <p>? Forum</p> <p>? Other information disclosure channels</p>	<p>? Project company</p> <p>? Evaluation agency</p>	<p>? During the evaluation process and before the first draft is published</p>

Applicable Activities	Stage	Content of Public Participation	Possible Method	Responsible Unit	Time
		? Collect public opinions on the above-mentioned environmental and social assessment documents or other assessment documents related to the project, and update and give feedback.	? On site ? Enterprise website; ? Enterprise public account; ? Other information disclosure channels	? Project company ? Evaluation agency	? After the first draft of the Chinese version of the project-related evaluation report is formed, a round of publicity will be conducted, and the time will not be less than 14 days  ? After the final Chinese version of the project-related evaluation report is formed, a round of publicity will be conducted, and the time will not be less than 14 days.
	Construction stage	? Accept public supervision on project site environmental monitoring indicators and other aspects	? Enterprise website; ? Enterprise information bulletin board	? Project company ? Construction unit ? Supervision unit	? Every day
	Operation stage	? Accept public supervision on environmental monitoring indicators and other aspects of facility enterprises	? Enterprise website; ? Enterprise information bulletin board	? Project company	? Every day



**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) Yes**

The key Citizen Engagement tool under this project is through the establishment of a project level grievance redress mechanism (GRM) at FECO, as well as separate functioning GRMs to be established at each participating pilot enterprises under Component 2, targeted to workers. Satisfactorily response to any grievance received through these GRMs is being tracked as an intermediary results indicator under the project's results framework. Moreover, although this would take place outside the scope of the project as part of the MEE approval process following submission of proposals for revision by the project, China has an established mechanism to seek feedback and inputs from the public at large in the development of standards and technical specifications, including from other departments, the public at large, universities, and enterprises. Drafts are issued for public comments, and individual submissions are discussed as to whether they can be accepted or rejected before the final draft is put to approval.

### **3. Gender Equality and Women's Empowerment**

**Provide the gender analysis or equivalent socio-economic assesment.**

During project preparation, as per GEF requirements, a gender assessment has been prepared to comply with the GEF's Policy on Gender Equality (SD/GN/02), aligned with the WBG Gender Strategy (FY2016-23). Through implementing BATs in the non-ferrous metal industry, the project will benefit many enterprises economically, which will lead to a better income for both genders working in the industry. Moreover, the health benefits through reduced human exposure to mercury will also benefit both genders of the population working in the sector and living in proximity with the sector's production facilities. During the project preparation and implementation consultations, participation and awareness raising activities will be carried out involving women's groups, among the local civil society organizations, to ensure that gender issues will be mainstreamed to inform project design and decisions. A gender analysis was conducted as part of the ESIA for the first pilot identified during project preparation and a Gender Action Plan (GAP) has been prepared to promote gender equality and women empowerment. The TORs of related work will include gender responsive contents, such as gender responsive questionnaire to make sure that gender aspects are taken into consideration during development of the related policies, regulations and guidelines. Gender-disaggregated data and

information will be collected as appropriate for the number of beneficiaries, demonstration enterprises, and other key stakeholders, with at least 30% of representatives of women consulted, 45% joining training and awareness raising activities (e.g., technical training, career development, health and safety), and 48% benefit from project activities and results. The pilot enterprises aim to improve gender balance by identifying and incorporating concerns of women employees in the design of management measures, technical upgrade and training plans, and increasing the percentage of women taking management positions. The pilot enterprises and project implementation offices will assign dedicated people/agencies to implement and monitor the Gender Action Plan (GAP) and ensure that the TOR for project monitoring will include monitoring of implementation of the GAP and female beneficiaries and stakeholders will participate in the monitoring activities. During the pilot project selection, FECO and the technical assistance team conducted site visits and consultations with managements of the potential demonstration companies of the project, local government departments like Ecological and Environment Bureau, Industrial Parks, representatives of employees and community representatives ((including women representatives). Gender related issues have been discussed during the visits, such as gender equality and empowerment, needs and expectations of women; potential environmental and social impact on women, and difference of career development status between men and women. The feedback from women has been incorporated into the updated gender analysis and GAP.

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

Yes

**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**

**Does the project's results framework or logical framework include gender-sensitive indicators?**

Yes

#### **4. Private sector engagement**

**Elaborate on the private sector's engagement in the project, if any.**

The project is centered on the engagement of the non-ferrous industry for reduction of mercury emissions and release. The demonstration enterprises selection is based on open, transparent and competitive calls for proposal and evaluation by FECO against a set of criteria agreed with the World Bank. One enterprise was selected before CEO endorsement. The participating enterprises have to demonstrate good environmental and social management practices. The focus of the project is wholly to deliver global public goods in the form of global environmental benefits from mercury abatement; the mercury reduction benefit that would accrue is very large and the overall cost to the GEF relatively lowest; the enterprises are expected to provide cofinancing in the order of nearly nine times the size of

the grant they receive (1:9) towards the delivery of the global benefits that the project seeks to achieve, in addition to their baseline financing; and the participating enterprises agree to independent verification of their performance and collection and dissemination of lessons learned. The project is not expected therefore to confer any direct competitive advantage to the participating enterprises, and in particular would not lead to increased product market price.

## 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
High or Substantial	High or Substantial		

#### 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.

### B.2. Specific Risks and Impacts

A brief description of the potential environmental and social risks and impacts relevant to the Project.

ESS2 Labor and Working Conditions

ESS2 is relevant to the project. Direct workers include FECO staff assigned to work on this project, as well as people employed by the participating enterprises to work specifically in connection with the operation of this project. Contracted workers include people employed or engaged by contractors, such as consultants, installing equipment, and testing equipment etc. According to site ESIA and DD report, no primary supply workers are identified to be involved directly in , providing goods and materials essential for the core functions of the pollution control, waste disposal and technology upgrade.

Community workers are unlikely to be involved considering the project nature of technical upgradation. The project investment focuses on the upgrading of environmental pollution facilities which will have minor impact on reducing workers on operation lines. The enterprises with significant impact on labor and working condition are excluded through E&S screening process defined in the ESMF. The number and types of workers involved in the subprojects will be identified in site specific ESIA to ensure risks and impacts related to labor and working conditions for demonstration enterprises are properly assessed in the ESIA and mitigation measures well developed in the site ESMP.

China has comprehensive regulations on labor and working conditions, which are generally in alignment with the scope of the ESS2. China's labor authorities at all levels are stepping up supervision of factories, particularly key industries, to ensure adequate labor law enforcement and sound and fair treatment of all types of workers. The project will select qualified enterprises demonstrating good labor management performance, thus the risks of child labor and forced labor in participating enterprises are low. During the appraisal stage, one polluting site was selected and the DD report found less than 20 workers of the production line need to switch their position within the enterprises, and preconsultation and proper trainings will be conducted for these changes. With these measures in place, the risks and impact on retrenchment of workers are considered low.

OHS risks are common and deemed substantial for the operation of non-ferrous metal smelting industries, including, for example, chemical exposure, physical hazards, noise, radiation, and confined space entry, which also form part of project design following BAT/BEP requirements when designing, constructing, and operating the upgraded mercury control facilities in the existing lead and zinc smelting industries selected for demonstration. Following the ESMF requirements, the Health Impact Assessment (HIA) will be conducted and integrated into the specific ESIA for selected demonstration activities, just like what has been done for Yuguang subproject (the first pilot), to identify and address potential health risks related to project-supported activities. The HIA will be conducted with reference to all applicable national laws and regulations, as well as the requirements of ESS2, applicable World Bank Group Environmental Health and Safety (EHS) guidelines, BAT/BEP guidance and other GIIPs relevant to the project activities. In the case of Yuguang, with reference to the comparable GIIPs, the site-specific ESDD and ESIA found no significant gap identified on OHS management, and adequate mitigation measures have been proposed in the site ESMP to enhance the site's OHS management performance.

With the current COVID-19 situation in China, the daily average reported local case is below 10 therefore the risk of exposure to COVID-19 is considered low. For the physical activities under the project, the existing national regulations and good international practice (for example, WHO guidelines) on infection prevention and control procedures will be followed to prevent COVID-19 exposure in the provinces where activities are held for PMO staff, consultants, and contract workers who are involved in the project.

The ESMF has included a template of labor management procedure (LMP), which set up principles and requirements on managing labor issues at subproject level. All subprojects should maintain a labor management procedure proportionate to the E&S risks and impacts and consistent with the requirements of the ESS2. During the site DD and ESIA preparation work, if any risks and impacts regarding on labor condition identified, remediation measures shall be developed and actions should be taken as part of ESMP or a standalone LMP should be prepared for the site to fill in the gaps.

### **ESS3 Resource Efficiency and Pollution Prevention and Management**

ESS3 is relevant. Non-ferrous metal smelting enterprises are inherently heavy polluting and energy intensive. While contributing to the control of mercury pollution and possibly other organic pollutants (depending on the adopted techniques) from non-ferrous metal industry, the project activities, particularly the small-scale demonstration pilots, are designed for pollution reduction but will also bring some impacts and pressure on the environment during construction and operation, including consumption of resources (e.g., energy and water), management of hazardous materials, generation of air emissions, noise, wastewater, conventional and hazardous waste, and OHS hazards. The construction nuisance will be generally temporary and site-specific, while potential impacts on air and water during operation could be significant due to leaching or vaporization of elemental or oxidized mercury from hazardous mercury-containing waste. The management of mercury-containing materials, including storage, disposal, and trade, should be consistent with the BAT/BEP guidance for the Minamata Convention. During project implementation, clean production opportunities with reference to relevant GIIPs will be sought to enhance energy and resource efficiency and to reduce greenhouse gases emission through specific pilots and further promoted replication and influence on the industry to adopt BAT/BEP.

It is noted that the Chinese government has made significant efforts in recent decades on reducing pollution and energy consumption from industrial sectors with the development and enforcement of more and more stringent environmental policies and standards. For example, the Ministry of Industry and Information Technology (MIIT) of China introduced the Qualification Conditions for Lead and Zinc Industry in March 2020 to promote the high-quality development, which include the requirements on energy and resource consumption and environmental protection. The project will provide technical assistance to address guidelines, regulations, capacity building and a national program to enhance BAT/BEP replication and sustainability. During preparation, relevant domestic regulations and their enforcement have been reviewed against the requirements of ESS3 and other applicable GIIPs, including the World Bank's Environmental, Health and Safety Guidelines (EHSGs) to confirm the adequacy of existing system for pollutant control in non-ferrous metal industry in China. According to the ESIA findings during preparation, no major gap is identified in this regard.

Since the E&S performance of the selected enterprises are deemed critical in the management of potential E&S risks and impacts in the sector, due diligence has been conducted during the EA process to review the overall E&S performance of potential participants. In addition, the project will support technical assistance activities to facilitate the pace of industry-wide adoption of BAT/BEP, for example, review of regulation enforcement, evaluation of mercury control measures and technologies, awareness campaign and dissemination, and so on. Relevant Terms of References (ToRs) will reflect the requirements of ESS3. Based on the findings from sector review and Yuguang ESIA, the criteria for the selection of demonstration enterprises/activities have been established for Component 2, including the requirements on E&S eligibility. Thus, the project will only support the enterprises with compliant environmental performance, those with established environmental management system. As part of the project design and site-specific ESIA/ESMP, mitigation measures will be proposed to enhance the existing ESMS of selected enterprises, including seeking the opportunities for maximum pollution reduction and internal carbon emission. In the case of Yuguang, the ESIA concluded that the proposed demonstration activities would increase the site's acid sludge disposal capacity by 3.7 times and reduce the site's mercury discharge (in gaseous and solid forms) by 47.0003t/a and Particulate Matter (PM) emission by 3.4688t/a. Also, based on the assessment, Yuguang has planned additional low carbon and energy saving renovation project (beyond current GEF financing) to offset the limited increase of energy consumption (240tce/a) and carbon emission (421tCO<sub>2</sub>/a) with the operation of demonstration activities.

Considering the potential of heavy metal pollution of non-ferrous metal smelting industry, as required in the ESMF, the health and safety risk assessment will be conducted as part of the site-specific ESIA for demonstration subprojects (already done for Yuguang subproject) to evaluate the significance of potential risks posed by demonstration activities on the environment and human health (workers and surrounding communities if any) and the adequacy of existing environmental management practice of selected demonstration enterprises. These has been reflected in the ESIA, E&S due diligence and ESMP for the first selected piloting project, Yuguang subproject. Through the site-specific assessment, no major gap was identified in this regard and adequate mitigation measures have been included in the subproject ESMP to

further improve the site's OHS management, including the requirements on integrating necessary OHS facilities in the project design.

#### **ESS4 Community Health and Safety**

ESS 4 is relevant to the project. Depending on where the pilot enterprises are located, the project could pose community health and safety risks in the transport and use of hazardous materials and the disposal of hazardous waste. The operation of demonstration subprojects will not increase the impacts on local communities as the investment will focus on upgrading and improving existing facilities' pollution control equipment that contributes to the reduction of mercury pollution. Following current practice in China and as reflected in the site-specific ESIA, safety assessment (covering traffic safety management), firefighting review will be conducted for all the demonstration activities before implementation to ensure the integration of all the necessary safety measures into the project design. During preparation, relevant domestic practice has been reviewed against the ESS4 requirements and other applicable GIIPs to confirm the adequacy of existing system in China. Though no major gap is identified, necessary safety considerations covering both construction and operation periods have been reflected in the ESMF and will be further specified and addressed during the site-specific ESIA/ESMP. In addition, the Health Impact Assessment (HIA) will be conducted as part of the site-specified ESIA to identify and address potential health risks related to project-supported demonstration activities, with reference to all applicable national laws and regulations, as well as the requirements of ESS2, applicable World Bank Group Environmental Health and Safety (EHS) guidelines, BAT/BEP guidance and other relevant GIIPs. In addition, potential COVID-19 risk will also be considered as part of the project design and subproject ESIA. The physical activities will follow the existing international and national infection prevention and control procedures to prevent COVID-19 exposure in the provinces where activities are held for PMO staff, consultants, and contract workers who are involved in the project.

The risks of labor influx and GBV during construction are low. No construction camp will be set up and there will be only limited number of additional workers introduced to the site for installing equipment or other upgrading activities during a short period.

#### **ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement**

The project activities will take place on existing industrial land owned or used by the participating enterprises. As a result, land acquisition and resettlement are not envisaged at this stage. However, ESS5 is deemed relevant considering the due diligent on land use for demonstration enterprises. Potential impacts on land use will be further reviewed during subproject E&S screening process and site specific due diligent work. In the project's ESMF, the E&S screening checklist has established clear criteria to screen out subprojects with significant resettlement impacts and include provisions to identify legacy resettlement issues for specific subprojects through the due diligence work. A TOR on land acquisition and resettlement DD has been included in the ESMF. ESMF requires if there are gaps identified from the DD a Remedial Action Plan should be prepared. In addition, a Resettlement Policy Framework including key elements of principles, entitlement matrix etc are also in the ESMF to guide the preparation of an Action Plan.

#### **ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources**

ESS6 is deemed irrelevant at this stage. Based on current design, the project will only involve civil works when piloting mercury reduction and recycling techniques and practices in selected lead and zinc smelting enterprises. The project activities will only support the upgrading and improvements of existing facilities' pollution control equipment in the industrial and developed areas. Therefore, it is unlikely that the project will bring impacts/risks on the areas of high value or sensitivity. In addition, all subprojects will be screened against exclusion criteria to eliminate any activities with potential impacts on natural habitat or biodiversity.

### **ESS7 Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities**

ESS7 is deemed relevant, as the presence of ethnic minorities at pilot subproject areas cannot be excluded. For the first selected subproject, the presence of ethnic minorities are mainly small number of ethnic Hui workers in the participating enterprise and no ethnic minority community is identified in the nearby areas. According to the ESIA report, there is no significant impact to the ethnic minority people identified for project invested activities. Should there be any impacts, ethnic minorities can either be the project workers or present in the local communities within the area of influence of the subprojects.

ESMF indicates the geographical spread of lead and zinc smelting enterprises are mostly located in the Southern, Southwestern, Northern and Northwestern part of the country by virtue of rich ore reserves. If subprojects are located in areas characterized by ethnic minorities such as Southwestern, northern and northwestern China, potential impacts and risks on ethnic minority communities living on and/or close to pilot enterprises or mercury contaminated areas need to be further examined during the site selection and ESIA preparation. The ESMF has included a E&S screening checklist to screen out subprojects that pose significant impacts on ethnic minorities. Both the project-level SEP and the subprojects' stakeholder engagement activities should incorporate culturally appropriate engagement methods to ensure meaningful consultations with the ethnic minorities throughout the project lifecycle.

#### **Supporting Documents**

Upload available ESS supporting documents.

<b>Title</b>	<b>Module</b>	<b>Submitted</b>
<b>China Non-ferrous Appraisal ESRS CEO endorsement</b>	<b>CEO Endorsement ESS</b>	
<b>Concept Environmental and Social Review Summary (ESRS) 9-14-21</b>	<b>Project PIF ESS</b>	



**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).

**Results Framework**  
**COUNTRY: China**  
**Sustainable Mercury Management in Non-ferrous Metal Industry**

**Project Development Objectives(s)**

The Project Development Objective (PDO) is to demonstrate best available techniques and best environmental practices in selected enterprises and promote sector-wide replication.

**Project Development Objective Indicators**

RESULT\_FRAME\_TBL\_PDO

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
Mercury reduction by demonstration enterprises (Metric ton/year)		0.00	0.00	0.00	30.00	50.00	60.00	60.00	60
Mercury reduction from Lead, Zinc and Copper sectors (Metric ton/year)		0.00	0.00	0.00	30.00	50.00	110	110	110
Four standards will be revised to support Hg emission reduction in the sector, of which three will be adopted and one will be proposed. (Number)		4	0	0	2	2	4	4	4
Three technical guidelines will be developed and released to support Hg emission reduction in the sector, of which two will be adopted and one will be proposed (number)		1	0	0	2	2	3	3	3
Proposals on management plans/programmes for waste management in provincial level (number)		0	0	0	0	1	1	1	1
Development of replication plan for scaling-up BAT/BEP implementation and will be adopted (number)		0	0	0	0	0	1	1	1
Development of Implementation plan for five enterprises (number)		0	0	0	0	0	0	5	5
BAT/BEP Demonstrated (Number)		0	0	0	1	3	4	4	4
Direct project beneficiaries (Number), among which		0	0	0	10,000	40,000	60,000	100,000	100,000



Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
Women beneficiaries (Number)		0	0	0	5,000	20,000	30,000	50,000	50,000

## Intermediate Results Indicators by Components

Indicator Name	PBC Baseline		Intermediate Targets						End Target
			1	2	3	4	5	6	
Component 1-Strengthen Regulatory Framework and Knowledge Dissemination									
Proposals developed on guidelines, standards and plans/programes to strengthen regulatory framework to support mercury management and reduction in the sector, of which six will be adopted and 8 will be proposed. (Number)		5	0	0	4	6	9	14	14
Number of enterprises that have developed an implementation plan to replicate the piloted BAT/BEP (Number)		0	0	0	0	0	5	5	5
Number of participants of training and dissemination activities for the sector (women percentage 15%) (Number)		0	0	0	200	500	1000	1000	1000
Number of people (general public) joining the awareness raising activities (women 50%) (Number)		0	0	0	2000	10000	17000	17000	17000
Grievances recorded through project level-grievance redress mechanisms are resolved in a timely manner (Percentage) (Percentage)		0	0	0	100	100	100	100	100
Component 2 -Demonstration of Mercury Emission Control and Recovery Technology									

# RESULT\_FRAME\_TBL\_IO

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
Number of enterprises demonstrating BAT/BEP for mercury reduction and recycling (Number)		0	0	0	1	3	4	4	4
Online monitoring equipment in operation (Number)		0	0	0	1	3	4	4	4
Component 3 -Project Management									
Sound project management with timely project progress report. (Text)	12	NA	Satisfactory project management rating						Sound project management
			Semiannual report and annual report						

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Mercury reduction by demonstration enterprises (Metric ton/year)	This indicator measures the number of BAT/BEP demonstrated in the project enterprises. At least six are anticipated, including mercury recovery from gas and wastes. gas mercury emission reduction and wastewater mercury discharge reduction, reduced mercury in sulfuric acid, The amount of mercury in the concentrate, the amount of mercury in the waste.	Verification within six months after implementation of BAT/BEP measures	Monitoring report from independent verification consultant and project progress report.	Sampling and laboratory analysis by an accredited laboratory.	FECO, through consulting firm.

Mercury reduction from Lead, Zinc and Copper sectors (Metric ton/year) , among them	<p>This indicator measures progress toward reduction of mercury from Lead, Zinc and Copper sectors that All enterprises must meet the limits of the revised national emission standards. The revised emission standards are assumed to meet World Bank guidelines. Target corresponds to an assumption of atmospheric mercury emission in Lead and Zinc smelting decreased from 0.05mg/m<sup>3</sup> to 0.02mg/m<sup>3</sup>, in copper smelting from 0.012mg/m<sup>3</sup> to 0.01mg/m<sup>3</sup>, and wastewater mercury discharge in Lead and Zinc smelting decreased from 0.03mg/ L to 0.01mg/ L. in copper smelting from 0.05mg/ L to 0.01mg/ L</p>	Verified by the revised version of emission standards was issued and implemen	Monitoring report by Supervisory testing and third party testing		FECO, through consulting firm.
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Proposals on policies, standards (4), guidelines (5) and operational manual for improving and strengthening the regulatory framework to support mercury management and reduction in the sector.	<p>This indicator measures strengthening of regulatory instruments to promote mercury reduction. Four national standards proposed for revision are:(i) Specification for limits of hazardous elements in heavy metal gold mineral products-2007;(ii) Industrial sulfuric acid(GBT534-2014);(iii) Emission Standard of Pollutants for Lead and Zinc Industry (GB 25466-2010);(iv) Emission standard for copper, nickel and cobalt industrial pollutants (GB25467-2010).One guidance on general industry solid waste from non-ferrous smelting and one sector replication plan will be developed. Three are expected to be submitted to MEE, and two are expected to be issued by MEE.</p>	Semi-annual report and annual report	Project progress report; proposed revision of the standards	PMO reporting	FECO
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Direct beneficiaries	<p>This indicator measures the population directly benefiting from the project, defined as the number of workers at enterprises engaged in the project as well as the residents around the enterprises, either as participating enterprises through Component 1, or through technical assistance under Component 2. Assuming at least 9 beneficiary enterprises(Four demonstrations, five planned to replicate the piloted BAT/BEP), each with about 2000 workers and residents leads to a total of 18,000 direct beneficiaries, of which 15 percent are estimated to be women. Considering the potential broader impact on the general public living within a distance where environmental levels of mercury may be directly affected by the point sources addressed by the project, the direct beneficiaries can be roughly estimated to be 100,000, of which 50 percent are female.</p>	Annual	Project progress report and participating enterprises reporting and training records.	PMO and participating enterprise reporting.	FECO and participating enterprises.
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Women beneficiaries	Number of workers and managers in the sector, including enterprises and administration, joining the training and dissemination activities. The current percentage of female workers and managers in the enterprises is about 15%. Half of the residents around nine businesses are women	Annual.	Project progress report and training records (with percentage of women specified)	PMO reporting.	FECO and participating enterprises.
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ME PDO Table SPACE

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Number of enterprises demonstrating BAT/BEP for mercury reduction and recycling (4)	This indicator measures the number of enterprises that demonstrated the BAT/BEP.	Semi-annually	Project progress report and reports from participating enterprises under subgrant agreements.	PMO and participating enterprise reporting.	FECO
Mercury reduction of mercury by demonstration enterprises, and the reduction of mercury from Lead, Zinc and Copper sectors	This indicator measures the number of BAT/BEP demonstrated in the sector. At least four are anticipated, including mercury recovery from gas or wastes, gas mercury emission reduction and wastewater mercury discharge reduction, reduced mercury in sulfuric acid	Semi-annually	Project progress report and reports from participating enterprises under subgrant agreements; completed BAT/BEP application manuals.	PMO and participating enterprise reporting.	FECO

Number of enterprises that have developed an implementation plan to replicate the piloted BAT/BEP (5)	Number of enterprises that have developed an implementation plan to replicate the piloted BAT/BEP	Semi-annually	Project progress report and participating enterprise reports to replicate the piloted BAT/BEP	PMO and replicating enterprises report.	FECO
Proposals on policies, standards (4), guidelines (3) and operational manual for improving and strengthening the regulatory framework to support mercury management and reduction in the sector.	<p>This indicator measures strengthening of regulatory instruments to promote mercury reduction. Four national standards proposed for revision are:(i) Specification for limits of hazardous elements in heavy metal gold mineral products-2007;(ii) Industrial sulfuric acid(GBT534-2014);(iii) Emission Standard of Pollutants for Lead and Zinc Industry (GB 25466-2010);(iv) Emission standard for copper, nickel and cobalt industrial pollutants (GB25467-2010).One guidance on general industry solid waste from non-ferrous smelting and one sector replication plan will be developed. Three are expected to be submitted to MEE, and two are expected to be issued by MEE.</p>	Mid term, end of project	???????FECO/MEE	Progress report	FECO/MEE

Online monitoring equipment in operation	The online monitoring equipment installed and operational for the demonstrated enterprises	Semi-annual	FECO/Enterprises	Progress report	FECO/Enterprises
Number of participants of training and dissemination activities for the sector (women percentage 15%)	Number of workers and managers in the sector, including enterprises and administration, joining the training and dissemination activities. The current percentage of female workers and managers in the enterprises is about 15%.	Semi-annually	FECO/Industry Association	Progress report	FECO/Industry Association
Sound project management with timely project progress report.	It indicates a satisfactory rating for project management and semi-annual progress report submitted on time with good quality. 12 reports in total.				

**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).**

GEF Secretariat comments	Team response
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Please clarify if mercury removed from emission sources will be environmentally managed in accordance with the requirements of the Minamata Convention.

Yes, mercury removed from emission sources will be environmentally managed in accordance with the requirements of the Minamata Convention (MC). Smelting is one of the 5 source categories listed by the MC that need to be controlled for air emissions as a priority. There are no quantitative reduction targets. However, for new sources parties MUST use best available techniques (BAT) and best environmental practices (BEP) to control and reduce emissions, as soon as practicable but no later than five years after the Convention enters into force for that Party (Aug 2022 for China). For existing sources, mercury emissions should be controlled as soon as practicable, but no later than 10 years after the Convention becomes effective for the country (Aug 2027 for China). Control options include emission on limit values and BAT/BEP. The mercury removed from emission sources will be managed using BAT/BEP demonstrated under component two. This will include demonstration of gaseous mercury recovery and concentration technology to promote mercury recovery in lead and zinc smelting enterprises, such as installation of recycling equipment for gaseous mercury from acid production and concentration equipment for sewage acid to reduce the concentration of mercury in acid and improve the acid end-product quality as well as increase the mercury concentration in sewage acid to facilitate recovery efficiency. The limit values may also be more stringent as a result of strengthened policies, standards, and guidelines under component one.

<p>It is noted that the project includes preliminary information on expected roles and responsibilities of key stakeholder groups during project preparation and implementation. Please include some information on stakeholder consultations carried out during design.</p>	<p>During project design stage and the preparation of PIF and project concept documents, the Foreign Environmental Cooperation Center (FECO) has undertaken extensive consultations with the relevant stakeholders, such as the central and local environmental administrative authorities (Ministry of Ecology and Environment, Ministry of Industry and Information Technology and Ministry of Finance, and their provincial and local offices), nonferrous metal industry associations, potential pilot enterprises, communities and scientific research institutes through meetings and field visits. Workshops, virtual and face to face meetings have been organized with participation of the priority provinces for non-ferrous metal smelting, and discussed the background of project development, the status quo of relevant domestic policies, standards and technologies, trajectory of the industry development, and project objectives and main activities to be supported. Several meetings have been organized to help improve the PIF and project concept documents.</p>
<p>Please provide additional information in this section particularly how engagement will be planned and implemented and please provide some indicative information on any gender dimensions related to project activities.</p>	<p>Through implementing best available technologies in the non-ferrous metal industry, the project will benefit many enterprises economically, which will lead to a better income for both genders working in the industry. Moreover, the health benefits through reduced human exposure to mercury will also benefit both genders of the population working in the sector and living in proximity with the sector's production facilities. During the project preparation and implementation consultations, participation and awareness-raising activities will be carried out involving women's groups among the local civil society organizations to ensure that gender issues will be mainstreamed to inform project design and decisions. Gender-disaggregated data and information will be collected as appropriate for the number of beneficiaries, relevant studies, demonstration enterprises, and other key stakeholders. Planning, consultation, and budgeting, including at the provincial and municipal levels or at the community level, will necessitate the participation and engagement of women to accurately reflect their needs and priorities to improve mercury management.</p>

Please elaborate on risks due to climate change and covid-19.

In general, there are low risks due to climate change impact. In the project areas to be identified, potentially climate change could lead to more frequent extreme weather events, leading to flooding and other natural disasters. These disaster events may have an adverse impact on field work, enterprise production and other relevant activities. When selecting the demonstration enterprises, the project will consider the probability of the relevant disasters and mitigations measures where the demonstration enterprises are located. During the implementation of project activities, the relevant activities will be scheduled reasonably to avoid the period of high disaster incidence as much as possible. The COVID risks are also rated low given the effective prevention policies and measures implemented in China. An annex is attached regarding the COVID risks and climate change.

Is the institutional arrangement for project/program coordination including management, monitoring and evaluation outlined? Is there a description of possible coordination with relevant GEF-financed projects/programs and other bilateral/multilateral initiatives in the project/program area?

Under the leadership of the Ministry of Ecology and Environment, the project will be implemented through a project management office established at FECO. FECO will be responsible for overall project monitoring, management, and coordination, in close cooperation with the Ministry of Industry and Information Technology, the Non-ferrous Metal Industry Association, other relevant line ministries, and provincial and local departments for ecology and environment. FECO has extensive experience in implementing and coordinating GEF and World Bank supported and complex grant projects in the past 30 years on more than 20 operations. Under these projects and the proposed project FECO is responsible for daily project management, cross agency coordination, Monitoring & Evaluation activities, social and environmental safeguards, and fiduciary aspects, including coordination with other GEF-financed projects/programs and other bilateral/multilateral initiatives, such as the GEF financed Green Production and Sustainable Development in Secondary Aluminum, Lead, Zinc and Lithium Sectors in China Project (FECO and UNDP as implementing agencies), Environmentally Sustainable Iron and Steel Industry Development Project (FECO and World Bank as implementing agencies), GEF Capacity Strengthening for Implementation of Minamata Convention on Mercury Project (FECO and WB as implementing agencies), working closely with MEE, MOF and Provincial Departments of Ecology and Environment. Based on agreed annual implementation plans, FECO will manage and supervise the implementation of all project activities and will prepare and submit to GEF and the World Bank the project progress and financial reports on a semiannual basis.

Consistency with National Priorities: Has the project/program cited alignment with any of the recipient country's national strategies and plans or reports and assessments under relevant conventions? Please elaborate on this point.

The project is in line with the priorities identified by the ongoing GEF Capacity Building for Implementation of Minamata Convention on Mercury Project and builds on the outcomes of the National Strategy on Implementation of MC, and the Action Plan for Non-ferrous Metal Industry prepared under the ongoing project. In addition, the GEF Reduction of Mercury Emissions and Promotion of Sound Chemical Management in Zinc Smelting Operations Project was implemented by FECO and United Nation Industry Development Organization (UNIDO) from 2013 to 2015. The relevant reports and assessments carried out under this project are also used to inform the project design.

Indeed, the project is also fully consistent with the government's priorities placed on pollution prevention and control of mercury and other heavy metals due to their significant negative impact on human health and the environment. Since 2009, mercury pollution prevention and control have been addressed together with conventional pollutants (SO<sub>x</sub>, NO<sub>x</sub>, and PMs). In 2013, the Action Plan for Air Pollution Prevention and Control was issued by the State Council to further strengthen the comprehensive control of air pollution, which also helped reduce mercury emission through synergistic control measures. The Three-Year Action Plan to Win the Battle for a Blue Sky that was issued by the State Council in 2018 called for the establishment of strict management systems of atmosphere and waste in key industries such as non-ferrous metals. The Ministry of Industry and Information Technology (MIIT)'s Development Plan for the Non-ferrous Metal Industry (2016-2020), outlines specific measures to promote energy saving and emission reduction in non-ferrous smelting. These measures promote the reduction of conventional pollutants and environmentally sound management of solid waste, together with mercury control, including: upgrading smelting furnaces to save energy and reduce consumption; optimizing the layout of industrial parks; and reorganizing, merging, and removing low-efficiency production capacity.

Moreover, the project is aligned with China's focus on transitioning to a more balanced and sustainable economic growth paradigm. The 13th Five-Year Plan (FYP) (2015-2020) emphasized quality of growth and the importance of shifting towards green development. This includes a high-level focus on enhanced ecological and environmental protection, innovation-driven development, and increased

stringency of environmental regulations. The 14th FYP (2021?2025) released in March 2021 emphasized ?harmonious coexistence between human beings and nature.? The FYP aims to build an ?ecological civilization?, accelerating green and low-carbon development, and improving environmental quality and resource utilization efficiency. Moreover, it calls for green transformation of production and lifestyle, sustained reductions in emissions of major pollutants, and increased recycling and reuse. In September 2020, China committed to a zero net carbon emissions target by 2060 with peak emissions by 2030.

Please provide information on: 1) how existing lessons informed the project concept and plan, 2) plans to learn from ongoing relevant projects and initiatives, 3) proposed tools and methods for knowledge exchange, learning and collaboration, 4) proposed knowledge outputs to be produced and shared with stakeholders, 5) a discussion on how knowledge and learning will contribute to overall project impact and sustainability, and 6) plans for strategic communications.

The proposed project builds on the ongoing World Bank-supported Global Environmental Facility (GEF) Capacity Building for Implementation of Minamata Convention on Mercury Project (US\$8 million of GEF financing). It has been under implementation since 2016 with a Project Development Objective (PDO) to (a) develop a national strategy on mercury and related action plans and (b) improve China's mercury management capacity and readiness to implement this strategy in the project provinces. Its successful implementation has resulted in a draft national strategy that is being reviewed by the Ministry of Ecology and Environment (MEE), incorporating sectoral and provincial sub-strategies and action plans. Moreover, a national-level mercury flow management information system (MIS) has been developed and integrated into the National Statistics Bureau's system, filling the gap of a dedicated subsystem for mercury, which is a breakthrough and has far-reaching impact. The project is also building the local laboratories' capacities, carrying out risk assessments of contaminated sites, and promoting awareness of the industries and general public. These activities are improving China's capacity for long-term environmentally sound management of mercury, mercury reduction and phaseout efforts, and readiness to implement the national strategy.

In addition, the GEF (US\$1 million of GEF financing) Reduction of Mercury Emissions and Promotion of Sound Chemical Management in Zinc Smelting Operations Project was implemented by FECO and United Nation Industry Development Organization (UNIDO) from 2013 to 2015. Lessons and experience from these projects have been used to inform the project design, which will continue during implementation. Going forward, knowledge sharing with other projects, such as the GEF financed Green Production and Sustainable Development in Secondary Aluminum, Lead, Zinc and Lithium Sectors in China Project (UNDP and FECO as implementation agencies), Environmentally Sustainable Iron and Steel Industry Development Project (FECO and World Bank as implementing agencies), and relevant domestic projects will be carried out through coordination of FECO, MEE, MOF and Provincial Departments of Ecology and Environment. The international and domestic experience and good practices will be incorporated into the project design and implementation, including identification of financially and technically viable technologies for the pilot

enterprises that have the potential to be replicated for the industry.

To support industrywide replication and long-term sustainability of project outcomes, component 1 entails the formulation and promotion of a plan for adoption of the technology of mercury emission control for non-ferrous metal smelting based on the results of the demonstration activities implemented under Component 2 and disseminate project experience and knowledge to help raise the awareness of environmental risk prevention, mercury control, and convention implementation in the non-ferrous metal smelting sector?targeting industry, environmental protection authorities and general public. It will also inform the formulation of relevant sections of the national plans for the non-ferrous metal sector. The knowledge products may also include publications, online and social media feeds, posters, brochures, and movies and so on. Knowledge dissemination could use a wide range of means, such as workshops, large international and domestic environmental protection events, training, online posts and events, community awareness raising activities, and road shows.

Furthermore, component 1 also aims to include the following outputs, review of the Guideline on Best Available Technologies (BAT) of Pollution Prevention and Control for Lead Smelting (HJ-BAT-7, 2012), developing a guideline on BAT for zinc smelting to assess the gaps with MC control requirements and need for revisions; review and development and/or revision of related operational manuals; formulating relevant national plans for non-ferrous metal sector informed by project outputs; and assessment of mercury recovery rate from waste streams.

Sustainability is built in the project design through application of the improved guidelines and standards to the whole industry, based on the demonstrated technologies and good practices, to achieve long-term impact. The enterprises in the industry are expected to be incentivized to adopt new techniques and practices in order to meet the relevant emission and release standards in a consistent manner. Other incentives include tax reduction for reduced mercury emission, improved recovery rate resulting in improved quality of by-product, and recycled mercury for commercial use.



There must be included in the CER a comprehensive plan to manage mercury that is removed from emissions

The mercury control measures for mercury wastes will follow the principle of "reduce, recycle and reuse". Recovered mercury is mainly stored in recycling enterprises and managed in accordance with China's requirements for the storage of hazardous chemicals. Recycled mercury is mainly used for the production of mercury-added products (including thermometers and sphygmomanometers) and PVC production as permitted by the Minamata Convention on Mercury.

China has established a statistical system under the GEF financed China Capacity Strengthening for Implementation of Minamata Convention on Mercury Project (closed in Oct. 2022). It is used to collect/track information on mercury production and use on an annual basis to help ensure that mercury is used for purposes permitted under the Convention. The national level mercury flow MIS has been approved by the Ministry of Ecology and Environment (MEE) and National Statistics Bureau (NSB), and integrated into NSB's system. It is a breakthrough, filling the gap of a dedicated sub-system for mercury in the national information systems. Connected to and complementing two very important systems, i.e., National Environmental Statistics System and Pollution Permitting System, it provides a systematic enhancement at the national level, which is also used to inform decisions and report to the Minamata Convention as needed. The first statistics requests to track mercury was assigned by the NSB in June 2021, with data collection completed in September 2021, and data submission, consolidation and verification in November 2021 for all 19 provinces that have mercury related industries. The final report was approved and released in March 2022, and was the first ever national level monitoring report for mercury and mercury compounds, including: basic information of the enterprises, capacity, output, inventory, use and destination of mercury or mercury compounds.

Most of the mercury in flue gas enters into the acid sludge with a mercury content of 0.5-1 percent. The recovery and utilization of mercury from the acid sludge would reduce the potential migration of mercury to the environment in the process of acid sludge stockpiling and disposal. In fact, byproduct mercury recovery from nonferrous smelting operations is an important source of global mercury supply, estimated at around 500 tons per year, or 15 percent of total global supply, and therefore reduce the need for mercury mining and associated energy

consumption and environmental impact<sup>[1]</sup> while bringing about circular economy benefits (see para 10 of the PAD).

The management of mercury-containing materials, including storage, disposal, and trade, is required to be consistent with the BAT/BEP guidance for the Minamata Convention. During project implementation, clean production opportunities with reference to relevant Good International Industry Practice (GIIP) will be sought to enhance energy and resource efficiency and to reduce greenhouse gases emission through specific pilots and further promoted replication and influence on the industry to adopt BAT/BEP (see page 10 - 13, B2 of the ESRS, including the following paras).

It is noted that the Chinese government has made significant efforts in recent decades on reducing pollution and energy consumption from industrial sectors with the development and enforcement of more and more stringent environmental policies and standards. During preparation, relevant domestic regulations and their enforcement have been reviewed against the requirements of ESS3 and other applicable GIIPs, including the World Bank's Environmental, Health and Safety Guidelines (EHSs) to confirm the adequacy of existing system for pollutant control in non-ferrous metal industry in China. According to the ESIA findings during preparation, no major gap is identified in this regard.

Since the E&S performance of the selected enterprises are deemed critical in the management of potential E&S risks and impacts in the sector, due diligence has been conducted during the EA process to review the overall E&S performance of potential participants. In addition, the project will support technical assistance activities to facilitate the pace of industry-wide adoption of BAT/BEP, for example, review of regulation enforcement, evaluation of mercury control measures and technologies, awareness campaign and dissemination, and so on. Relevant Terms of References (ToRs) will reflect the requirements of ESS3. Based on the findings from sector review and Yuguang ESIA, the criteria for the selection of demonstration enterprises/activities have been established for Component 2, including the requirements on E&S eligibility. Thus, the project will only support the enterprises with compliant

	<p>environmental performance, those with established environmental management system. As part of the project design and site-specific ESIA/ESMP, mitigation measures will be proposed to enhance the existing ESMS of selected enterprises, including seeking the opportunities for maximum pollution reduction and internal carbon emission. In the case of Yuguang, the ESIA concluded that the proposed demonstration activities would increase the site's acid sludge disposal capacity by 3.7 times and reduce the site's mercury discharge (in gaseous and solid forms) by 47.0003t/a and Particulate Matter (PM) emission by 3.4688t/a. Also, based on the assessment, Yuguang has planned additional low carbon and energy saving renovation project (beyond current GEF financing) to offset the limited increase of energy consumption (240tce/a) and carbon emission (421tCO<sub>2</sub>/a) with the operation of demonstration activities.</p> <p>Considering the potential of heavy metal pollution of non-ferrous metal smelting industry, as required in the ESMF, the health and safety risk assessment will be conducted as part of the site-specific Environmental and Social Impact Assessment (ESIA) for demonstration subprojects (already done for Yuguang subproject) to evaluate the significance of potential risks posed by demonstration activities on the environment and human health (workers and surrounding communities if any) and the adequacy of existing environmental management practice of selected demonstration enterprises. These have been reflected in the ESIA, E&amp;S due diligence and Environmental and Social Management Plan (ESMP) for the first selected pilot project, Yuguang subproject. Through the site-specific assessment, no major gap was identified in this regard and adequate mitigation measures have been included in the subproject ESMP to further improve the site's OHS management, including the requirements on integrating necessary OHS facilities in the project design.</p>
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<b>Council comments at PIF approval</b>	<b>Team response</b>
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**Austria comments:** On the project in China (Sustainable Mercury Management in Non-ferrous Metal Industry), how will GEF ensure that ILO standards are adhered to given the remote working set up of the project? How will the Council be informed about the further assessments that are mentioned in this context

Many thanks. ESRS has been prepared by the World Bank safeguards specialists. In the ESRS, Environment and Social Standards 2 (ESS2) of the World Bank's Environmental and Social Framework policy applies to the project. Direct workers include FECO staff assigned to work on the Project, as well as people employed or engaged directly by the participating enterprises to work specifically in connection with the project-supported activities. Community workers are unlikely to be involved considering the project nature of technical upgradation. The number and types of workers that may be involved in the subprojects will be identified for each demonstration enterprise and the selection of subprojects will follow Environment & Social (E&S) screening criteria defined in an Environment and Social Management Framework (ESMF, to be prepared during project preparation) to ensure that activities that may have significant negative impact on labor and working condition are excluded, including the exclusion of all activities involving risks of child labor and forced labor. That is, the project will only select qualified enterprises demonstrating good labor management performance.

China has comprehensive regulations on labor and working conditions, which are generally in alignment with the scope of the ESS2 and ILO standards. China's labor authorities at all levels are stepping up supervision of factories, particularly key industries, to ensure adequate labor law enforcement and sound and fair treatment of all types of workers. At the appraisal stage, the due diligence and assessment work on the first pilot site finds the demonstration activities focused on the upgrading of existing/new production lines will have minor impact on reducing workers in the participating enterprise and is unlikely to result in the retrenchment of workers. The main category of workers will be direct workers of PMO staff and piloting enterprises and contracted workers who will be engaged in upgrading activities, such as installation and testing of equipment. Community workers will not be involved considering the technical and specialist nature of project activities.

OHS risks are deemed substantial for the operation of non-ferrous metal smelting industries, including, for example, chemical exposure, physical hazards, noise, radiation, and confined space entry. All these will be considered and properly addressed following BAT/BEP requirements when designing, constructing, and operating the upgraded mercury control facilities in the existing lead and zinc smelting enterprises selected for demonstration. Following the ESMF requirements, the Health

Impact Assessment (HIA) will be conducted and integrated into the specific ESIA's for selected demonstration activities, just like what has been done for Yuguang subproject (the first pilot), to identify and address potential health risks related to project-supported activities. The HIA has been and will be conducted with reference to all applicable national laws and regulations, as well as the requirements of ESS2, applicable World Bank Group Environmental Health and Safety (EHS) guidelines, BAT/BEP guidance and other applicable Good International Industry Practice (GIIPs) relevant to the project activities.

The ESMF has included a template of labor management procedure (LMP), which set up principles and requirements on managing labor issues at subproject level. All subprojects will maintain a labor management procedure proportionate to the E&S risks and impacts and consistent with the requirements of the ESS2. During the site DD and ESIA preparation work, if any risks and impacts regarding on labor condition identified, remediation measures shall be developed, and actions will be taken as part of ESMP or a standalone LMP will be prepared for the site to fill in the gaps.

The ESMF (covering HIA and the template of LMP) and the first demonstration site's ESIA (including due diligence report) has been publicly disclosed locally in October 2022 and will be disclosed at the World Bank's website before approval of the Project. After project approval, the World Bank task team will field supervision missions twice a year to visit the demonstration enterprises together with FECO and will closely monitor and report on the compliance of the safeguards policies and requirements. GEF will have access to these reports, such as Aide Memoire and Implementation Status Report (ISR). The disclosable sections of the ISR will also be publicly disclosed, including the rating and compliance with safeguards requirements. The World Bank E&S specialists in the task team are based in Beijing and work closely with FECO and local implementing agencies to ensure compliance of the relevant ESF policies and requirements

**Canada comments:**

We note that this project is expected to contribute towards reducing emissions of mercury from the non-ferrous metal sector in China, which is estimated to emit approximately 90 tons of mercury annually.

We agree that there is the potential for increased GHG emissions with some BAT/BEP, however, and China should be encouraged to consider this aspect as part of the pilot project analysis.

Many thanks. The contribution to GHG emissions-reduction of the proposed project activities is estimated, balancing the increased emissions due to increased energy use for enhanced mercury removal and recovery with reduced emissions from energy savings and switching to renewable energy. The following analysis is an estimate based on data available for the first pilot already selected - Yuguang Zn. According to the ESMP, the mercury removal and recovery activities implemented at that pilot plant would lead to an increase of CO<sub>2</sub> emissions by 184 tons per year. Various energy saving measures such as replacement with high-efficiency pumps and motors and waste heat utilization would lead to carbon emissions reduction of 5850 tons per year, offsetting the increase in emissions due to enhanced mercury control. Moreover, Yuguang is planning to invest in photovoltaic (PV) power generation through solar rooftop PV and with a PV power station to partially replace the electric energy provided by a coal-fired thermal power station, contributing further 60,025 tons CO<sub>2</sub> emissions reduction per year. This is part of a broader industry trend to act on greenhouse gas emissions. Combining the CO<sub>2</sub> emissions reduction measures under Component 2 with attention to GHG emissions considerations in the technical assistance activities under Component 1, in particular development of guidelines for BAT/BEP in their dissemination and replication plan, a conservative estimate is that 20 percent of project financing would be directly related to climate co-benefits. We fully agree with the suggestion and this has been included as part of the pilot project analysis.

**Canada:** We note with approval that the project is designed to address barriers to adoption of BAT/BEP in the non-ferrous metal industry. We would recommend further detail to ensure a better understanding of the mercury flow during the smelting processes, and in solid wastes and waste acid, which remains poorly understood and can lead to low recovery of mercury from various waste streams.

(para 10 ? 12, PAD). As the synergistic control of mercury is achieved through abatement of conventional pollutants, most of the mercury is largely transferred from flue gas to solid waste stream and products where it is poorly controlled, and, since mercury cannot be destroyed or degraded, ends up released to the environment in the longer run. Most of the mercury in flue gas enters into the acid sludge with a mercury content of 0.5?1 percent. The recovery and utilization of mercury from the acid sludge would reduce the potential migration of mercury to the environment in the process of acid sludge stockpiling and disposal. In fact, byproduct mercury recovery from nonferrous smelting operations is an important source of global mercury supply, estimated at around 500 tons per year, or 15 percent of total global supply, and therefore reduce the need for mercury mining and associated energy consumption and environmental impact[2]2 while bringing about circular economy benefits.

To meet the emission standards, nonferrous metal smelters mainly adopt the abatement technologies that involve dust removal, flue gas purification, acid production, and desulfurization to control the emissions of particulate matter and SO<sub>2</sub> in flue gas. The many types of abatement technologies individually or in combination result in a mercury removal efficiency as follows:[3]3 lead smelting 29.16?98.66 percent, zinc smelting 41.07?99.28 percent, copper smelting 94.74?99.31 percent with the lower mercury removal efficiency achieved by simpler combination of abatement technologies that only focuses on dust removal and the higher efficiency achieved by more complex combination that also includes acid production and desulfurization. Since the implementation of the Action Plan for the Prevention and Control of Air Pollution, with the strengthening of the SO<sub>2</sub> emission limits for nonferrous metal smelting, many enterprises have gradually added desulfurization systems.

Even though the tightened emission standards for conventional pollutants provided synergized control of mercury emissions there is still a need of dedicated mercury control technologies and practices in order to meet the international standards. Moreover, the emission standards in China are expected to be further strengthened, calling for specialized mercury control techniques. Lastly, the effect of synergized control is typically effective at removing particulate mercury (Hg<sub>p</sub>), and some oxidized mercury (Hg<sub>2</sub><sup>+</sup>), but not

elemental mercury vapor.[4]4 Typically, a large portion of the mercury (for example, 80 percent) emission in the gas streams from the nonferrous metal smelting processes is in elemental vapor form.[5]5 Elemental mercury when escaped from the abatement devices of the smelters and released to the atmosphere may stay there for months, travel long distances, and lead to global environmental and public health impact. Therefore, specialized abatement technologies that can more effectively remove elemental mercury from the smelting flue gas are needed to reduce its global impact.

(para 29, PAD). The technologies to be demonstrated by the first selected enterprise - Henan Yuguang Zinc Industry Co., Ltd. includes: (1) increasing the pretreatment process of acid sludge to improve mercury recovery; (2) Upgrade the main equipment such as mixers and drying furnaces to fully automatic equipment, build a new supporting intermediate storage silo and belt closed conveying metering system, and improve the automation level of production; (3) The recycling workshop will be transformed to improve the closed exhaust effect, control the fugitive emission of flue gas, and then transform the exhaust gas collection and treatment system, increase the bag dust collector, the sodium polysulfide absorption tower, the potassium permanganate oxidation device, and the sodium sulfide absorption device to further reduce the pollutant emission level; (4) Optimize the wastewater treatment process for pH adjustment + coagulation precipitation, and all production wastewater is recycled and reused to reduce wastewater discharge.



<p><b>Canada:</b> We recommend an increased focus on monitoring capacity to ensure that the enterprises can meet the emission and release standards in a consistent and stable manner, even when the raw materials have higher mercury content</p>	<p>Fully agree. Gaseous mercury online monitoring equipment is to be installed for selected lead and zinc smelting demonstration enterprises. The available mercury online monitoring system is mainly based on cold atomic absorption spectrometry, which enables online monitoring of Hg in flue gas as well as temperature, pressure, humidity and flow rate, and generates spectrograms and environmental reports through a data acquisition and processing system, which can be transmitted remotely to ecological and environmental authorities at all levels. This demonstration activity enhances the mercury monitoring capability of non-ferrous metal smelting enterprises, and also enhances the government's ability to supervise mercury emissions from enterprises (Annex 2, para 19, PAD).</p>
<p><b>Japan Comments</b></p> <p>According to the document, the target facilities and the technologies to be applied are not specified. Although the requirement under the Minamata Convention is expected to apply in the near future, there is little information on progress in this area in terms of policy measures and project preparation. Timeline of the project preparation and implementation</p>	<p>Many thanks. Three kinds of technology will be demonstrated in the project : 1) Demonstration of specialized mercury control technology in selected lead and zinc smelting enterprises. At least one production line will be selected to demonstrate the specialized control technology including polymer adsorption materials, activated carbon filter beds and other technologies. 2) Demonstration of synergistic emissions control for conventional pollutants and mercury in selected lead and zinc smelting enterprises. At least one production line will be selected to demonstrate synergistic emission control technologies for conventional pollutants and mercury, including the renovation of high-efficiency dust removal facilities, the renovation of flue gas purification and flushing towers and mist eliminators, the renovation of acid production systems and desulphurization systems. 3) Demonstration of mercury concentration technology in acid sludge in selected lead and zinc smelting enterprises. At least three production line will be selected to demonstration mercury concentration and extraction from the acid sludge with the main technologies including acid sludge pretreatment, roasting with calcium and selenium fixation, mercury vapour condensation, crude mercury washing and selenium refining, etc. (para 29, PAD)</p>

<p><b>Norway and Denmark Comments</b></p> <p>While we appreciate the focus on mercury emissions in an important area, we also note the STAP review comment on seeking synergies with UPOP and carbon emissions and would like the Secretariat's view on this</p>	<p>Many thanks. (para 73, PAD) The contribution to GHG emissions-reduction of the proposed project activities is estimated, balancing the increased emissions due to increased energy use for enhanced mercury removal and recovery with reduced emissions from energy savings and switching to renewable energy. The following analysis is an estimate based on data available for the first pilot already selected - Yuguang Zn. According to the ESMP, the mercury removal and recovery activities implemented at that pilot plant would lead to an increase of CO2 emissions by 184 tons per year. Various energy saving measures such as replacement with high-efficiency pumps and motors and waste heat utilization would lead to carbon emissions reduction of 5850 tons per year, offsetting the increase in emissions due to enhanced mercury control. Moreover, Yuguang is planning to invest in photovoltaic (PV) power generation through solar rooftop PV and with a PV power station to partially replace the electric energy provided by a coal-fired thermal power station, contributing further 60,025 tons CO2 emissions reduction per year. Although the candidate enterprise is still an isolated case of building its own solar photovoltaic power station to replace fossil fuels with clean energy, this is part of a broader industry trend to act on greenhouse gas emissions. Combining the CO2 emissions reduction measures under Component 2 with attention to GHG emissions considerations in the technical assistance activities under Component 1, in particular development of guidelines for BAT/BEP in their dissemination and replication plan, a conservative estimate is that 20 percent of project financing would be directly related to climate co-benefits.</p> <p>The UPOPs are not one of the key pollutants from the smelting of non-ferrous metal. Therefore there aren't emission limits for UPOPs in Emission Standards for Industrial Pollutants of Lead and Zinc (GB 25466-2010) and Emission Standards for Industrial Pollutants of Copper, Nickel and Cobalt (GB 25467-2010). The demonstration enterprises under the project are non-ferrous smelting enterprises instead of secondary non-ferrous enterprises. Thus the demonstration activities do not involve UPOPs emission processes.</p>
<p><b>United States Comments</b></p> <p>We are supportive of the efforts to reduce mercury emissions from non-ferrous mining sources. However, we have a series of concerns we would like to see addressed</p>	<p>Many thanks.</p>

**United States:** For this project, the technologies chosen will be Best Available Technologies, but we are concerned that some of these technologies mentioned in the proposal may not be developed enough to be considered BAT. The GEF does not fund R&D; so it is important that any technology selected has gone through enough evaluation that it qualifies as BAT. We would appreciate further information on the technology that will be used, and a clear process for identifying whether the mercury reducing technology is appropriate for this task

(para 29, PAD) Three kinds of technology will be demonstrated in the project : 1) Demonstration of specialized mercury control technology in selected lead and zinc smelting enterprises. At least one production line will be selected to demonstrate the specialized control technology including polymer adsorption materials, activated carbon filter beds and other technologies.2) Demonstration of synergistic emissions control for conventional pollutants and mercury in selected lead and zinc smelting enterprises. At least one production line will be selected to demonstrate synergistic emission control technologies for conventional pollutants and mercury, including the renovation of high-efficiency dust removal facilities, the renovation of flue gas purification and flushing towers and mist eliminators, the renovation of acid production systems and desulphurization systems. 3) Demonstration of mercury concentration technology in acid sludge in selected lead and zinc smelting enterprises. At least three production line will be selected to demonstration mercury concentration and extraction from the acid sludge with the main technologies including acid sludge pretreatment, roasting with calcium and selenium fixation, mercury vapour condensation, crude mercury washing and selenium refining, etc.

The demonstration performance will be verified and the demonstration technology and practice will be adopted as BAT/BEP (if results confirm so) in the revision of Technical Guidelines to be developed under the project.

**United States:** We would like to better understand the target industries and pilot locations

(para 5 ? 12, PAD) China is the world's largest producer of lead, zinc and copper. After the development of the past decade, China's lead-zinc-copper smelting capacity has basically reached its peak, lead-zinc-copper smelting enterprises are also strictly implementing the environmental protection system, the control level of conventional pollutants such as particulate matter, SO<sub>2</sub> and NO<sub>x</sub> in flue gas has been greatly improved, and the co-benefits of mercury removal of flue gas has also been greatly improved, and it is more difficult to further achieve flue gas mercury emission reduction through collaborative mercury control. Therefore, it is necessary to carry out demonstration and promotion of special mercury removal technologies for flue gases with a view to further reducing the mercury emission level of flue gas and controlling elemental mercury emissions. While the mercury control effect of flue gas is improving, the mercury content entering the solid waste is gradually increasing, of which the mercury content in the sour mud is the highest (0.5%~1%), and the recycling value is also higher. Demonstration of technology for the recovery of solid wastes, especially acid sludge, will increase the recovery rate of mercury from mercury-containing wastes, reduce the concentration of mercury in by-product sulfuric acid products, and reduce the release of mercury to the environment during the storage and disposal of solid wastes.

Mercury exists as a trace element in ore bodies of the non-ferrous metals, and the mining and mineral processing of these ores (including smelting) has the potential to mobilize mercury and emit to the environment. Mercury emissions from non-ferrous metal production depend mainly on the content of mercury in the non-ferrous metal ores used and the type of industrial technology, as well as the control technology employed in the production of non-ferrous metals. The mineral resources of non-ferrous metals result in a long smelting process involving complex technology and numerous types of solid wastes. It is estimated that some 3 to 10 percent of mercury in the system originally present as impurity in the ore is emitted through flue gas while 90 to 97 percent goes into the effluents, solid waste residue, and the sulfuric acid. Mercury recovery from waste acid, solid waste residue, and sulfuric acid is therefore an issue of concern in the process of mercury control from non-ferrous metal smelters.

To meet the existing standards, nonferrous metal smelters mainly adopt the abatement technologies that involve dust removal, flue gas purification, acid production, and desulfurization to control the

emissions of particulate matter and SO<sub>2</sub> in flue gas. The many types of abatement technologies individually or in combination result in a mercury removal efficiency as follows: lead smelting 29.16%~98.66 percent, zinc smelting 41.07%~99.28 percent, copper smelting 94.74%~99.31 percent, with the lower mercury removal efficiency achieved by simpler combination of abatement technologies that only focuses on dust removal and the higher efficiency achieved by more complex combination that also includes acid production and desulfurization. Since the implementation of the Action Plan for the Prevention and Control of Air Pollution, with the strengthening of the SO<sub>2</sub> emission limits for nonferrous metal smelting, many enterprises have gradually added desulfurization systems. Consequently, the synergistic atmospheric mercury removal efficiency of conventional pollutants in nonferrous metal smelting enterprises with acid production system and desulfurization system can reach as high as 95 percent.

Furthermore, the demonstration of mercury recovery technology from the acid sludge is required by the implementation of Article 9, Article 11, and Article 12 of the MC as well as recommended in China's industrial guidance documents. Comprehensive resource utilization rate (including recovery and recycling) of the hazardous waste in China from the zinc and lead smelting is 49.2%~53.1 percent and that from the copper smelting is 37.3%~53.3 percent for 2013~2015. Although this value has been improved to more than 60 percent in recent years, demonstration and promotion of new mercury recovery technologies and practices will further improve the mercury recovery rate and reduce the release of mercury into water and soil during the disposal of acid sludge. In the solid waste such as waste acid and waste residue, the content of mercury in waste acid is relatively high, of which lead smelting is about 73.6% , zinc smelting is about 59.4% , copper smelting is about 71.81%. Therefore, the recovery of mercury from acid sludge is not only a requirement for waste reduction, recycling and environmentally sound management, but also an effective way to reduce the release of mercury from the non-ferrous metal industry to the environment.

Demonstration of specialized flue gas mercury recovery technologies and technologies for the recovery of mercury-containing wastes is a core activity of the project. At the same time, in order to

promote the promotion of demonstration technology in the whole industry, the project will solidify the demonstration experience into the corresponding management regulations by revising the limit specifications for harmful elements in heavy metal gold mineral products, the emission standards for atmospheric pollutants in lead, zinc and copper smelting, the BAT/BEP guidelines, and the preparation of general solid waste management guidelines, demonstration technology promotion plans and promotion implementation plans. In addition, the project will carry out capacity building activities such as demonstration experience publicity to raise industry-wide awareness of demonstration technologies and related management requirements, and promote the full implementation of the promotion plan.

During the preparation of the project, Henan Yuguang Zinc Company Limited (also known as ?Yuguang Zinc?) was selected as the first demonstration enterprise.

**UNITED STATES:** Finally, the goal of reducing 90 tons of mercury being released is admirable. We would appreciate further clarity on where and how this mercury will be stored and how it will be used? Also, how will the project developers ensure the mercury is used in accordance with the Minamata Convention on Mercury?

The mercury control measures for mercury wastes will follow the principle of "reduce, recycle and reuse". Recovered mercury is mainly stored in recycling enterprises and managed in accordance with China's requirements for the storage of hazardous chemicals. Recycled mercury is mainly used for the production of mercury-added products (including thermometers and sphygmomanometers) and PVC production as permitted by the Minamata Convention on Mercury.

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Most of the mercury in flue gas enters into the acid sludge with a mercury content of 0.5-1 percent. The recovery and utilization of mercury from the acid sludge would reduce the potential migration of mercury to the environment in the process of acid sludge stockpiling and disposal. In fact, byproduct mercury recovery from nonferrous smelting operations is an important source of global mercury supply, estimated at around 500 tons per year, or 15 percent of total global supply, and therefore reduce the need for mercury mining and associated energy

consumption and environmental impact[6]6 while bringing about circular economy benefits (see para 10 of the PAD).

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It is noted that the Chinese government has made significant efforts in recent decades on reducing pollution and energy consumption from industrial sectors with the development and enforcement of more and more stringent environmental policies and standards. During preparation, relevant domestic regulations and their enforcement have been reviewed against the requirements of ESS3 and other applicable GIIPs, including the World Bank's Environmental, Health and Safety Guidelines (EHSGs) to confirm the adequacy of existing system for pollutant control in non-ferrous metal industry in China. According to the ESIA findings during preparation, no major gap is identified in this regard.

Since the E&S performance of the selected enterprises are deemed critical in the management of potential E&S risks and impacts in the sector, due diligence has been conducted during the EA process to review the overall E&S performance of potential participants. In addition, the project will support technical assistance activities to facilitate the pace of industry-wide adoption of BAT/BEP, for example, review of regulation enforcement, evaluation of mercury control measures and technologies, awareness campaign and dissemination, and so on. Relevant Terms of References (ToRs) will reflect the requirements of ESS3. Based on the findings from sector review and Yuguang ESIA, the criteria for the selection of demonstration enterprises/activities have been established for Component 2, including the requirements on E&S eligibility. Thus, the project will only support the enterprises with compliant environmental performance, those with



	<p>established environmental management system. As part of the project design and site-specific ESIA/ESMP, mitigation measures will be proposed to enhance the existing ESMS of selected enterprises, including seeking the opportunities for maximum pollution reduction and internal carbon emission. In the case of Yuguang, the ESIA concluded that the proposed demonstration activities would increase the site's acid sludge disposal capacity by 3.7 times and reduce the site's mercury discharge (in gaseous and solid forms) by 47.0003t/a and Particulate Matter (PM) emission by 3.4688t/a. Also, based on the assessment, Yuguang has planned additional low carbon and energy saving renovation project (beyond current GEF financing) to offset the limited increase of energy consumption (240tce/a) and carbon emission (421tCO<sub>2</sub>/a) with the operation of demonstration activities.</p> <p>Considering the potential of heavy metal pollution of non-ferrous metal smelting industry, as required in the ESMF, the health and safety risk assessment will be conducted as part of the site-specific Environmental and Social Impact Assessment (ESIA) for demonstration subprojects (already done for Yuguang subproject) to evaluate the significance of potential risks posed by demonstration activities on the environment and human health (workers and surrounding communities if any) and the adequacy of existing environmental management practice of selected demonstration enterprises. These have been reflected in the ESIA, E&amp;S due diligence and Environmental and Social Management Plan (ESMP) for the first selected pilot project, Yuguang subproject. Through the site-specific assessment, no major gap was identified in this regard and adequate mitigation measures have been included in the subproject ESMP to further improve the site's OHS management, including the requirements on integrating necessary OHS facilities in the project design.</p>

## Sustainable Mercury Management in Non-ferrous Metal Industry (P175980)

### STAP Comments and Task Team Response

<b>GEF ID</b>	10864
<b>Project Title</b>	Sustainable Mercury Management in Non-ferrous Metal Industry
<b>Date of Screening</b>	8 Oct 2021
<b>STAP member screener</b>	Jamidu Katima
<b>STAP secretariat screener</b>	Sunday Leonard
<b>STAP Rating</b>	<p><b>Minor issues to be considered during project design</b></p> <p>STAP acknowledges that on scientific or technical grounds the concept has merit. The proponent is invited to approach STAP for advice at any time during the development of the project brief prior to submission for CEO endorsement.</p>

Reviewer	Comment	Team Response
<b>Climate change impact and risks</b>		
STAP	<p>Although an environmental and social assessment of the project's potential impacts was prepared, the possible effects of climate change on the project have not been addressed. Climate risk screening for this project deserves attention. First, because smelters are major energy users, any changes to productivity could impact the carbon emissions profile. Further due diligence approaches in this regard should be mentioned. Second, changing climate is expected to affect the transport and fate of mercury in the environment (see, for example, Siddiqi 2018: <a href="https://doi.org/10.1007/978-3-319-58538-3_56-1">https://doi.org/10.1007/978-3-319-58538-3_56-1</a>). Hence it is essential to develop interventions considering the climate profile of the region where this project will be implemented. Therefore, we recommended that a detailed climate risk screening be carried out using available tools within the World Bank (for example, <a href="https://climatescreeningtools.worldbank.org/">https://climatescreeningtools.worldbank.org/</a>).</p>	<p>During project preparation climate risk screening will be carried out by the Bank's climate change assessment team and the potential effects of climate change on the project and mitigations measures will be assessed and included in the PAD. The transport and fate of mercury are in three categories: atmosphere, terrestrial ecosystem, and aquatic ecosystem. Climate change may have potential impacts on direct deposition of mercury through precipitation (rain and snow) and soil runoffs into aquatic ecosystems. Risk management of mercury will include reducing mobilization and concentration of mercury from industrial activities, which will be carried out by the project through reducing atmospheric mercury emission and improving mercury management in various waste streams.</p> <p>The team had sent a response to GEFSEC's comments regarding potential effects of climate change. When selecting the demonstration enterprises the project will take into consideration the probability of the climate change related natural disasters and the demonstration enterprises?</p>

Reviewer	Comment	Team Response
		<p>location, and a more detailed analysis will be carried out. Extreme weather events, such as severe storms and flooding may bring risks to the safe storage of mercury containing materials and wastes of the demonstration enterprises. While the enterprises already have relevant contingency plans as required in their domestic Environmental Impact Assessments the project will carry out further due diligence to ensure that the environmental and social safeguards policies will be complied with.</p> <p>The task team had also sent a response to GEFSEC's comment on potential impact on carbon emission profile due to changes to productivity. Firstly, factors such as energy saving, circular economy and efficiency will be included in the enterprise selection criteria to help reduce carbon emission. Secondly, the relevant domestic policies require that enterprises will need to offset additional carbon emissions by improving energy efficiency, increasing reuse and recycling etc, in case there are increases in productivity or capacity. Thirdly, performance evaluation of project supported enterprise activities will be carried out during implementation to ensure the relevant requirements are met. Moreover, the synergy effects (co-benefits) current and new climate change policies and mitigation options might have on mercury emissions reductions will also be further studied and linked to the project interventions. Further due diligence regarding impact on carbon emission profile will be assessed during project preparation.</p>
Project Design		

Reviewer	Comment	Team Response
STAP	<p>The proponents have presented a general theory of change with outputs in terms of "Best Available Technologies" (BAT). However, there needs to be further specificity around which of these technologies will be prioritized and based on which criteria. For example, there is a mention of bacterial agents as a possible mechanism for bioremediation. However, no citations or examples are given. There is a mention of a technology developed by Boliden in Sweden, but its efficacy and applicability are not presented. While further details may be developed during the PPG, there should be some defined parameters on prioritizing them in the PIF. A good recent citation to refer to in this regard is:</p> <p>? Yang, et al. 2021. Removing and recycling mercury from scrubbing solution produced in wet non-ferrous metal smelting flue gas purification process. Journal of Environmental Sciences, 103, 59?68. <a href="https://doi.org/10.1016/j.jes.2020.10.013">https://doi.org/10.1016/j.jes.2020.10.013</a>.</p>	<p>Thanks. During the PPG and implementation period further discussions will be held with the potential demonstration enterprises and technical experts regarding the technologies to be prioritized and selection criteria ensuring transparency, fairness and inclusiveness. The enterprises will be identified in a phased approach, based on a set of criteria combining elements including innovation, technical and financial viability, circular economy, energy saving, replicability, climate co-benefits etc. The selection processes will be elaborated in the Project Appraisal Document (PAD). The relevant project documents will also further explain the technologies being considered, and will include citations and examples.</p> <p>For example, the Boliden technology mentioned has been adopted by at least four factories in China, including Zhuzhou Smelter, Northwest Lead-Zinc Smelter, Shaoguan Smelter and Huludao Zinc Plant. The technology has been upgraded in China and recent research is undergoing experimental practice, including Shu Yang et al, (2021) "Removing and recycling mercury from scrubbing solution produced in wet nonferrous metal smelting flue gas purification process". Related biological preparations for the treatment of waste water ? ? new technology for smelting mercury-containing sewage acid biological preparations? has also been used in enterprises such as Zhuzhou Metallurgical Corporation. <span style="background-color: yellow;">█</span></p>
STAP	<p>Given that mercury emissions from the non-ferrous metal industry may occur concurrently with carbon dioxide and unintentional persistent organic pollutants (uPOPs) emissions (see Yan et al. 2020: <a href="https://doi.org/10.1016/j.chemosphere.2020.126958">https://doi.org/10.1016/j.chemosphere.2020.126958</a>; Katima and Leonard, 2020:</p>	<p>The Central government has issued the target to achieve peak carbon neutrality, with energy consumption per unit of GDP will be significantly reduced by 2030. Carbon dioxide emissions</p>

Reviewer	Comment	Team Response
	<p><a href="https://stagef.org/resources/advisory-documents/delivering-multiple-benefits-through-sound-management-chemicals-and">https://stagef.org/resources/advisory-documents/delivering-multiple-benefits-through-sound-management-chemicals-and</a>), there is an opportunity to link this project with carbon and uPOPs mitigation efforts including recent China's commitments to the Paris Agreement targets. Therefore, the technology selection process for this project should consider options that will deliver multiple benefits across climate change, mercury, and uPOPs mitigation. In line with the above, the Global Environment Benefits from this project needs to incorporate these potential opportunities for carbon and uPOPs mitigation co-benefits. We encourage the project proponent to carry out a detailed analysis of these benefits at the PPG stage and provide details of how the project will maximize and deliver the possible GEBs.</p>	<p>per unit of GDP is expected to be cut by at least 65% compared with 2005; the proportion of non-fossil energy consumption will reach about 25%, and the total installed capacity of wind and solar power will be over 1.2 billion KW. Prior to this, in April 2021, the relevant government departments issued the "Non-ferrous Metal Industry Carbon Peak Implementation Plan", which mentioned that the non-ferrous industry strives to take the lead in achieving carbon peak by 2025, and strive to achieve 40% carbon reduction by 2040.</p> <p>Since 2009, mercury pollution prevention and control have been addressed together with conventional pollutants (SOx, NOx, and PMs). The Ministry of Industry and Information Technology (MIIT)'s Development Plan for the Non-ferrous Metal Industry (2016-2020), outlines specific measures to promote energy saving and emission reduction in non-ferrous smelting, including: upgrading smelting furnaces; optimizing the layout of industrial parks; and reorganizing, merging, and removing low-efficiency production capacity. The ever strengthening control of conventional pollutants have had the co-benefit of reducing the emission of mercury, but specialized mercury removal technology is lacking. Thus the project will focus more on the specialized technology and the recovery of mercury from various waste streams.</p> <p>Nevertheless, the project will also seek opportunities to link its activities with carbon mitigation efforts. As mentioned above, the enterprise selection criteria will include carbon co-benefits together with synergistic control</p>

Reviewer	Comment	Team Response
		of conventional pollutants to help maximize the synergies. UPOPs seem more associated with secondary non-ferrous metal smelting while the demonstration enterprises under the project will mainly engage in primary non-ferrous production. Another GEF financed project in China is supporting UPOPs reduction through BAT/BEP in the secondary non-ferrous metal smelting. The project was co-developed by FECO and UNDP: ?Green Production and Sustainable Development in Secondary Aluminum, Lead, Zinc and Lithium Sectors in China? which was approved in 2020 with a GEF grant of US\$15.75 million.

[1] Lead and zinc industry specification conditions 2015.

[2] Lead and zinc industry specification conditions 2015.

[3] Based on a survey conducted by Tsinghua University. Output of GEF ?Capacity Strengthening for Implementation of Minamata Convention on Mercury Project?.

[4] United Nations Environment Programme. 2021. *UNEP Global Mercury Partnership Study Report on Mercury from Non-Ferrous Metals Mining and Smelting*, Geneva. Based an email correspondence with United States Environmental Protection Agency regarding the draft report.

[5] Wang, S. X., et al. 2006. ?Estimation of Atmospheric Mercury Emissions in China from Non-Coal Combustion Sources.? *Environmental Science* 27 (12): 2401-6.

[6] Lead and zinc industry specification conditions 2015.

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

**ANNEX D: Project Map(s) and Coordinates**

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



## ANNEX E: Project Budget Table

Please attach a project budget table.



Expenditure Category	Detailed Description	Component (US\$eq.)					Total (US\$eq.)
		Component 1	Component 2	Component 3	M&E	PMC	
		Outcome1	Outcome 2	Outcome 3.1			
Grants/ Sub-grants	BAT/BEP demonstration of 4 non-ferrous smelting enterprises		12,000,000.00				12,000,000.00
	5 duplication non-ferrous smelting enterprises(activity 1.3.1)	3,000,000.00					3,000,000.00
implementation agreements	Implementation Agreement with local EPBs (activity 1.5)	700,000.00					700,000.00
	Implementation Agreement with China Non-ferrous Metal Industry Association (CNIA) (activity 1.6)	150,000.00					150,000.00
Revolving funds/ Seed funds / Equity							-
Sub-contract to executing partner/ entity							-
Contractual Services – Individual	Recruitment of National Technical Advisor for project implementation (activity 1.6)	150,000.00					150,000.00
	Recruitment of Project assistant for project implementation (activity 3.2)			175,000.00		175,000.00	175,000.00
Contractual Services – Company	Mercury flow analysis in non-ferrous smelting industry to update the inventory of mercury emissions and releases (activity 1.1.1)	150,000.00					150,000.00
	Develop the standard for mercury content in mine and by-product acid (activity 1.1.1)	150,000.00					150,000.00
	Study on increasing production of secondary lead and zinc by the yield control of primary lead and zinc (activity 1.1.1)	150,000.00					150,000.00
	Promote the issue and implementation of BAT/BEP Guidance for Lead and Zinc as well as develop the BAT/BEP Guidance for Copper (activity 1.1.2 & 1.1.3)	300,000.00					300,000.00
	Develop environmental management guidelines for general industrial solid wastes containing mercury from non-ferrous industry (activity 1.1.4)	200,000.00					200,000.00
	Develop the program for wastes containing mercury from non-ferrous industry (activity 1.1.5)	250,000.00					250,000.00
	Evaluate the performance of demonstration activities in enterprises (activity 1.2)	284,000.00			284,000.00		284,000.00
	Develop the duplication plan for the whole non-ferrous industry (activity 1.3.1)	150,000.00					150,000.00
	Formulation of Brochure and video for demonstration experience (activity 1.3.2)	200,000.00					200,000.00
	Environmental and social security assessment on candidate demonstration enterprises (activity 1.4.1)	500,000.00					500,000.00
	Supervision for the implementation of the Environmental and social security in the demonstration enterprises (activity 1.4.2)	500,000.00					500,000.00
	Advice team for demonstration activities implementation (activity 1.6)	241,000.00					241,000.00
	Performance evaluation for project implementation (activity 3.4)			100,000.00	100,000.00		100,000.00
International Consultants							-
Local Consultants							-
Salary and benefits / Staff costs	PMO staffs of FECC (activity 3.3)			650,000.00		650,000.00	650,000.00
Trainings, Workshops, Meetings	dissemination trainings on replication plan (activity 1.3.2)	50,000.00				50,000.00	50,000.00
	Meetings & Workshops (activity 3.1)			20,000.00		20,000.00	20,000.00
Travel	Travel (activity 3.3)			20,000.00		20,000.00	20,000.00
	Study tour (activity 1.3.2)	160,000.00					160,000.00
Office Supplies	Toner drums, computers, laptop, printer, ect. (activity 3.3)			20,000.00		20,000.00	20,000.00
Other Operating Costs	Delivery Fee, Water and electricity charges (activity 3.3)			30,000.00		30,000.00	30,000.00
Grand Total		7,235,000.00	12,000,000.00	100,000.00	384,000.00	965,000.00	20,300,000.00

Note: The items in red are included as activities under the components under which they are listed, but the costs are charged to the PMC. M&E costs are included as part of the component totals to align with the component form, although M&E costs are listed twice, there is no double counting.

## ANNEX F: (For NGI only) Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

## ANNEX G: (For NGI only) Reflows



Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agency is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

**ANNEX H: (For NGI only) Agency Capacity to generate reflows**

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies' capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).