



Project Implementation Report

(1 July 2022 – 30 June 2023)

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| Project Title: | Demonstration of Mercury Reduction and Minimization in the Production of Vinyl Chloride Monomer in China |
| GEF ID: | 6921 |
| UNIDO ID: | 140214 |
| GEF Replenishment Cycle: | GEF-6 |
| Country(ies): | China |
| Region: | EAP - East Asia and Pacific |
| GEF Focal Area: | Chemicals and Waste (CW) |
| Integrated Approach Pilot (IAP) Programs¹: | Not applicable |
| Stand-alone / Child Project: | Not applicable |
| Implementing Department/Division: | ENV / MCM |
| Co-Implementing Agency: | Not applicable |
| Executing Agency(ies): | Foreign Environmental Cooperation Center, Ministry of Ecology and Environment, China |
| Project Type: | Full-Sized Project (FSP) |
| Project Duration: | 60 months |
| Extension(s): | 1 |
| GEF Project Financing: | USD 16,200,000 |
| Agency Fee: | USD 1,458,000 |
| Co-financing Amount: | USD 100,400,000 |
| Date of CEO Endorsement/Approval: | 7/5/2017 |
| UNIDO Approval Date: | 7/11/2017 |
| Actual Implementation Start: | 10/4/2017 |
| Cumulative disbursement as of 30 June 2023: | 15,773,813.20 |

¹ Only for GEF-6 projects, if applicable

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| Mid-term Review (MTR) Date: | 12/31/2021 |
| Original Project Completion Date: | 10/04/2022 |
| Project Completion Date as reported in FY22: | 12/31/2025 |
| Current SAP Completion Date: | 12/31/2025 |
| Expected Project Completion Date: | 12/31/2025 |
| Expected Terminal Evaluation (TE) Date: | 7/1/2025 |
| Expected Financial Closure Date: | 12/31/2026 |
| UNIDO Project Manager ² : | <i>Carmela Centeno</i> |

I. Brief description of project and status overview

| Project Objective | | |
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| <p>The overall objective is to reduce risks of mercury on human health and the environment from industrial production of Vinyl Chloride Monomers (VCM) in China. The specific objective is to demonstrate mercury-free technology and promote BAT/BEPs to reduce mercury release and emission from existing VCM facilities. By conversion to low-mercury catalyst and mercury-free catalyst technology in VCM industrial production, China will reduce by the year 2020, mercury use per unit of product in VCM/PVC industry by 50% compared with referential year of 2010. This will result in reduction of about 360 metric tons of mercury use in VCM industries.</p> | | |
| | Project Core Indicators | Expected at Endorsement/Approval stage |
| 1 | Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern | Reduction of 360 metric tons of Mercury |

| Baseline |
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| <ul style="list-style-type: none"> The Vinyl Chloride Monomer (VCM) project in China has been designed to adhere to the Minamata Convention (MC) objective of protecting human health and the environment from anthropogenic emissions and release of mercury and mercury containing compounds. After signing and ratifying in Oct 10, 2013 and August 2016 respectively, China identified the high mercury consumption and high risk of mercury pollution from the calcium carbide method (CCM) VCM industry as the key Chinese industry targeted for prevention and control of mercury pollution under the Minamata Convention. |

² Person responsible for report content

- China is the largest country in the world that uses CCM-VCM production to produce polyvinyl chloride (PVC). The VCM/PVC sector consumes more than half of the total mercury supply in the country, accounting for nearly 30% of the world's total mercury consumption.
- Under article five (5) of the Convention VCM was expected to be reduced by 50% in 2020 against 2010 use. However, VCM calcium carbide based process pose still utilized in China.
- China is transitioning to ethylene-dichloride (EDC) processes and encouraging large firms to invest in zero or low mercury-containing catalyst. Mercury waste in the PVC sector is also of primary environmental concern. To this effect, China has made efforts in prevention and control of mercury pollution in VCM industry and developed improved relevant policies and standards. To meet commitments made under the Minamata Convention, the project is enhancing regulatory, enforcement, BAT/BEP promotion, mercury recovery, contaminated site assessment and knowledge sharing.

Please refer to the explanatory note at the end of the document and select corresponding ratings for the current reporting period, i.e. FY23. Please also provide a short justification for the selected ratings for FY23.

In view of the GEF Secretariat's intent to start following the ability of projects to adopt the concept of adaptive management³, Agencies are expected to closely monitor changes that occur from year to year and demonstrate that they are not simply implementing plans but modifying them in response to developments and circumstances or understanding. In order to facilitate with this assessment, please introduce the ratings as reported in the previous reporting cycle, i.e. FY22, in the last column.

| Overall Ratings ⁴ | FY23 | FY22 |
|---|-------------------------|-------------------------|
| Global Environmental Objectives (GEOs) / Development Objectives (DOs) Rating | <i>Satisfactory (S)</i> | <i>Satisfactory (S)</i> |
| <p>The project has already achieved 359.5 tons of mercury reduction, which was verified by the mid-term review in 2021. In 2020, China has reduced the mercury by 50% compared to 2010 through the demonstration, BAT/BEP replication and capacity building activities. FECO and the Government of China commit to further strengthening efforts in mercury reduction.</p> <p>The mercury-free technology evaluation activity has started, and the participating companies have carried out a large number of laboratory, pilot, side and industrial tests at the early stage, laying a solid foundation for mercury-free evaluation and demonstration.</p> <p>There has been no change in the ratings between FY22 and FY23 as it is envisaged for the project to achieve its intended objectives.</p> | | |
| Implementation Progress (IP) Rating | <i>Satisfactory (S)</i> | <i>Satisfactory (S)</i> |
| <p>The implementation of activities in FY23 is on track per the revised work plan. Covid-19 and local lockdowns have delayed some of the field investigation trips but FECO has been actively following up with the contractors and plants for the updates.</p> | | |
| Overall Risk Rating | <i>Low Risk (L)</i> | <i>Low Risk (L)</i> |
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³ Adaptive management in the context of an intentional approach to decision-making and adjustments in response to new available information, evidence gathered from monitoring, evaluation or research, and experience acquired from implementation, to ensure that the goals of the activity are being reached efficiently

⁴ Please refer to the explanatory note at the end of the document and assure that the indicated ratings correspond to the narrative of the report

The risk rating remains the same as in FY22. There has been no substantial change to the national context and to the relevant stakeholders.

II. Targeted results and progress to-date

Please describe the progress made in achieving the outputs against key performance indicator's targets in the project's **M&E Plan/Log-Frame at the time of CEO Endorsement/Approval**. Please expand the table as needed.

| Project Strategy | KPIs/Indicators | Baseline | Target level | Progress in FY23 |
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| Component 1 – Strengthen institutional, regulatory, and enforcement (IRE) capacity in VCM production in China | | | | |
| Outcome 1: Institutional, regulatory, and enforcement capacity to fulfil obligations concerning VCM production sector under the Minamata Convention. | | | | |
| Output 1.1: National regulatory policy and regulatory frameworks developed to reduce and eliminate mercury use in industrial VCM production, with focus on mandatory policy to ban the use of high-mercury catalyst | Formulations or revisions of the regulations and policies in the VCM sector | Lack of effective regulations or policies to promote mercury pollution prevention, mercury-free and low mercury VCM production technologies and target on mercury – containing waste | 9 | <p>- 90% of the activities under this output have been completed and target for this output has been achieved by the end of FY21. The next workplans will locate resources for follow-up to ensure the output is completed. By FY23: An interdepartmental coordination mechanism established.</p> <p>9 regulations and policies revised and issued, including:</p> <ol style="list-style-type: none"> 1. A multi- ministry joint announcement to ban primary mercury mining; 2. Chlor-alkali industry standard conditions; 3. Development of the mercury pollution control technology policy; 4. Development of the caustic soda and PVC industry pollution control technology policy; 5. Development of national low-mercury catalyst standards in the VCM sector; 6. Development of emission standards in the chlor-alkali industry; 7. National Hazardous Waste List (mercury-containing waste from the VCM sector regarded as hazardous waste); 8. Feasible Technical Guide for Prevention and Control of the Pollution from Treatment and Disposal of Mercury-containing Waste; 9. Validation of the phase-out of high-mercury catalysts in the calcium-carbide-based VCM production enterprises. <p>9 policy recommendations proposed (2 adopted and 7 under discussion), including:</p> <ol style="list-style-type: none"> 1. Recommendation on revision of the Catalogue for Adjustment of Industrial Structure and industrial access policy: high-mercury catalyst-based VCM production categorized into the phase-out group; 2. Recommendation on carrying out cleaner production in calcium-carbide-based VCM sectors; 3. Recommendation on carrying out cleaner production in ethylene-based VCM sectors; 4. Recommendation on the technical guidance of the implementation of BAT/BEP in VCM sectors; 5. Recommendation on implementing a PRTR demonstration in calcium-carbide-based VCM sectors; 6. Recommendation on the technical policy on mercury-contaminated sites; 7. Recommendation on the emission standards in the mercury recycling sector; 8. Recommendation on the economic policy to promote research, development and application of mercury-free VCM production technologies; |

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| | | | | <p>9. Recommendation on the guideline for the environmental remediation of abandoned mercury mines and contaminated sites.</p> <p>Focus is placed on mandatory policy to ban the use of high mercury catalyst.</p> |
| Output 1.2: National managerial capacity and enforcement capacity strengthened to coordinate and monitor the VCM production sector | Number of environmental management officials or staff (female/male) trained | Lack of specific training for related personnel | 400 | <p>100% of the activities under this output have been completed and target for this output has been achieved by the end of FY23.</p> <ul style="list-style-type: none"> - According to relevant requirements, the high-mercury catalyst in the PVC production industry has been phased out in China by 2015. In 2020, FECO made nationwide investigations in Shandong, Inner Mongolia, and Shanxi province to assess the application status of low-mercury catalyst, and ensure the complete phase out of high-mercury catalyst, and in 2021, MEE carried out the supervision and inspection on the application of low-mercury catalyst and phase out of high-mercury at the state level to ensure the elimination of high-mercury catalyst used in the VCM sector in China. - In 2022, awareness-raising materials have been provided for Inner Mongolia, Sichuan and Shandong provinces. - From 2020 to 2022, about 4,700 officers at central and local levels trained to coordinate and monitor the VCM production centre. - In July 2022 and June 2023, MEE held the National Trainings on Chemical and Environmental Management and Convention Implementation. In 2022, the training sessions were attended by about 1,000 people (60 in-person and 940 online, 60% were female). In 2023, the sessions were attended by 2,100 people (100 in-person and 2,000 online). The training focused on the prevention and control of environmental risks of chemicals and elimination of potential environmental risks. It aimed to promote environmental risk assessment and control of existing chemical substances, strengthen environmental management, and enhance the awareness on the requirements of the MC and on the mandatory phase-out of mercury-added products and elimination of mercury-used processes. - In 2018, FECO undertook a mission to Japan to exchange experiences and information on mercury-containing waste technology and management. - In 2019, a mission to Germany and Belgium took place to exchange experiences and information on policy regulation of management and permanent storage of mercury waste. |

Component 2 – Promote technology transfer and investment for the widespread application of BAT/BEP

Outcome 2: Mercury emission reduced from VCM production through promotion of BAT/BEPs and if economical and technically feasible eliminate mercury

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| Output 2.1: Public-Private Partnership (PPP) established to promote R&D, venture capital investment and technology transfer | Number of promotion workshops held on venture capital investment and technology transfer through PPP mechanism | Lack of sufficient capital and technology transfer in the PVC industry | 2 | <p>- 100% of the activities under this output have been completed and target for this output has been achieved by FY23.</p> <ul style="list-style-type: none"> - By July 2020, this assignment has been accomplished by Renmin University of China. It has been recognized that the PPP mechanism is not applicable for mercury pollution control in PVC industry in China due to the national and provincial policies and technical and economic feasibility. - Two workshops were held on PPP mechanism in the VCM sector in 2018 and 2019, attended by 45 people (50% were female). - However, the project has established a fund raising mechanism through the state-local-demonstration and promotional enterprises' co-financing is the main financial source. The enterprise's investment and co-financing (cash or/and equity) account for the main part of the fund. In the |
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| | | | | <p>demonstration of low-mercury catalyst, the total funds to support the 4 pilot plants amounted to 21,280,000 RMB (approximately 3,274,000 USD). The total co-financing from these factories was 240,974,500 RMB (approximately 37,073,000 USD), 13 times higher than the investment from the project, ensuring the maximum efficiency and effectiveness of the GEF funding.</p> |
| <p>Output 2.2: Environmental Technology Verification (ETV) methodology established to verify the performance of low-mercury and mercury-free alternatives by an expert panel</p> | <p>Number of the alternative VCM production technologies evaluated</p> | <p>Lack of experiences on the ETV implementation for the VCM alternative technologies</p> | <p>2</p> | <p>- 70% of the activities under this output have been completed and target for this output has been achieved by FY23.</p> <p>- On June 18, 2021, an information exchange meeting on R&D and application of mercury-free catalyst and alternative technology was held and attended by representative from PVC plants, industrial associations, and R&D units. During the meeting, a lively discussion was made, focusing on a work plan to demonstrate mercury-free catalysts, evaluate alternative technologies, and examine the requirements and key points from the MC.</p> <p>- The mercury-free expert panel was established in November 2021, including experts and representatives from PVC plants, who are recommended by relevant industrial associations based on the actual circumstances. The expert panel assisted FECCO to develop a technical evaluation and other core documents, such as the mercury-free evaluation indicators and the mercury-free demonstration work plan.</p> <p>- On July 22, 2022, an information exchange meeting was held on mercury-free technology evaluation, joined by 20 people (2 were female). During the meeting, association experts and enterprise representatives expressed their concerns and interests in the activity, and shared their opinions and suggestions on the quantitative evaluation indicators.</p> <p>- Mercury-Free Catalysts and Alternative Technologies Evaluation: Through consultation with the technical representatives from the PVC plants and manufacturing plants, as well as expert in the VCM sector, it is found that in current R&D test and application of the mercury-free catalyst, the overwhelming majority is Au-based and Cu-based, which has unavoidable weakness in technical feasibility, economic feasibility and technical availability In November 2022, the Mercury-Free Catalysts and Alternative Technologies Evaluation was carried out through Request for Proposals (RFP). The goal is to evaluate 5-10 mercury-free test units from four aspects required by the MC, including technical feasibility, technical availability, economic feasibility, environmental and health risks and benefits, to identify their potential and feasibility for industrial application and promotion and to serve as a foundation for 10,000 tons mercury-free demonstration. Each PVC plant participating in this activity can apply for up to two test units of different mercury-free catalysts, and each test unit is expected to use only one type of mercury-free catalyst. During the evaluation activity, each test unit is expected to operate for more than 8,000 hours and its PVC production capacity is expected to be no less than 10,000 tons/year. Each test will receive funding according to the proportion of the production capacity of the test unit to the total production capacity of this evaluation activity. As of December 2022, 8 test units from 5 PVC plants participated in the RFP, including:</p> <ol style="list-style-type: none"> 1. Shaanxi Beiyuan Group Co., Ltd. 2. Inner Mongolia Ordos Group Co., Ltd. 3. Shaanxi Jintai Chlor-Alkali Chemical Co., Ltd. 4. Xinjiang Zhongtai Chemical Co., Ltd. 5. Baotou Haipingmian Polymer Industry Co., Ltd. <p>The first 3 PVC plants applied for testing two types of mercury-free catalyst: Au-based and Cu-based while the last 2 plants applied for testing only Cu-based catalyst. Of these 5 plants above, 3 were pilot plants for high efficient use of low-mercury catalyst and 2 were promotional plants.</p> |

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| | | | | <p>In January 2023, FECO held the expert meeting to review and assess the mercury-free evaluation applications submitted by the 8 test units of the 5 PVC plants. The initial assessment points out some challenges:</p> <ul style="list-style-type: none"> - The economic feasibility of the Au-based mercury-free catalyst is unstable considering the volatility of gold price and the limited quantity of this resource. - The technological feasibility of the Cu-based mercury-free catalyst needs further examination if spontaneous combustion could pose a risk to the process. <p>In May 2023, FECO has signed the contracts with these plants after negotiations.</p> <p>-In June 2023, FECO started the recruitment process of a technical expert to provide technical support for the mercury-free catalyst and alternative technology evaluation and for the 10,000-ton demonstration in the CCM-VCM sector in China.</p> |
| Output 2.3: Demonstration of low-mercury BAT/BEPs in 4 coal-based VCM companies and of mercury-free alternatives in a coal-based VCM company | Cleaner production audits and technology modification following BAT/BEP principles implemented | Lack of mature coal based low-mercury & mercury-free VCM technologies | 4 low-mercury & 1 mercury-free | <p>- 60% of the activities under this output have been completed and target for this output has been achieved by FY23.</p> <p>- According to relevant requirements in China, all VCM production plants have been requested to carry out cleaner production audits.</p> <p>- Low-mercury technology demonstration: the 4 low-mercury pilot plants finalized the pilot phases, achieved the mercury use below 43g/t PVC, and accomplished cleaner production audits and technology modification in 2021. The 4 PVC plants are:</p> <ol style="list-style-type: none"> 1. Shaanxi Beiyuan Group Co., Ltd. 2. Inner Mongolia Ordos Group Co., Ltd. 3. Xinjiang Zhongtai Chemical Co., Ltd. 4. Tianneng Chemical Co., Ltd. <p>The 4 PVC plants have lowered the use of mercury in terms of per unit production; disseminated successful experience on technique and management to other VCM manufacturing enterprises; implemented a recording of mercury release and transfer and assisted the project executive to prepare the technical guidance. In 2021, the environmental management departments in Yunnan province visited Xinjiang Zhongtai Chemical Co. to learn from its successful experience in mercury pollution prevention and control. In the same year, Inner Mongolia's environmental management departments made a visit to Shaanxi Beiyuan Co. to draw experience in VCM manufacturing.</p> <p>- Mercury-free technology demonstration: the 10,000-ton mercury-free demonstration is expected to be carried out based on the performance of the mercury-free evaluation activity.</p> |
| Output 2.4: Incentive program designed and implementation of major instruments (fiscal, monetary, venture capital, insurance etc.) to allow the private sector to access the technologies and experience gained from demonstrations | Number of enterprises implementing BAT/BEPs in the VCM sector | Lack of policy and economic incentive programs to promote mercury-free and low-mercury VCM production | 2 | <p>- 100% of the activities under this output have been completed and target for this output has been achieved by FY23.</p> <p>-The incentive mechanism has been promoted in combination with output 2.2 and 2.3. When PVC plants participate in these activities, the project provides funding for the activity implementation and the plants participated in this activity provide co-financing to facilitate the activity progress according to the project requirement. The incentive mechanism embodies this process, using financial support to promote the active participation of plants.</p> |
| Output 2.5: Replication of BAT/BEPs and of feasible mercury-free alternatives in 15 coal-based VCM companies nationwide | Number of enterprises implementing BAT/BEPs in the VCM | Most of the VCM production enterprises process with high-mercury catalyst technologies | 15 | <p>- 80% of the activities under this output have been completed and target for this output has been achieved by FY23.</p> <p>- Low-mercury technology replication: the replication for low-mercury technologies has been achieved.</p> |

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| | sector | | | <p>According to relevant requirements, the high-mercury catalyst in the PVC production industry has been phased out in China by 2015.</p> <p>FECO has published two rounds of RFP for replication of low-mercury BAT/BEPs. 7 promotional plants joined this activity (4 in the first batch and 3 in the second batch).</p> <p><i>Note: Originally, there were 8 promotional plants (5 in the first batch, and 3 in the second batch). However, in April 2021, due to the severe adverse impact of Covid-19, Inner Mongolia Wuhai Chemical Co., Ltd. failed to fulfil all the technological modification as scheduled and decided to quit the project.</i></p> <p>For better implementation of the MC, China has not only fulfilled the 50% reduction of mercury use in 2020 but also published relevant policies to promote the high efficient use of low-mercury catalyst in all PVC plants and to ensure the reduction of mercury after the project life cycle.</p> <p>The results from the 4 pilot plants have been replicated by 7 promotional PVC enterprises after carrying out technical upgrades, improving overall management systems to increase the efficiency of low-mercury catalyst use, and reducing mercury release and emission. The mercury consumption of these plants is below 49 g/t PVC. Due to the impact of Covid-19, the submission of the progress report on the BAT/BEP replication of some promotional plants was delayed to some extent. FECO has been following up with the plants on the project report.</p> <p>The 7 promotional plants are:</p> <ol style="list-style-type: none"> 1. Shaanxi Jintai Chlor-Alkali Chemical Co., Ltd. 2. Ningxia Younglight Chemical Co.Ltd. 3. Shihezi Tianyu Xinshi Chemical Co., Ltd. 4. Haohuayuhang Chemical Co., Ltd. 5. Shandong Lutai Chemical Co., Ltd. 6. Inner Mongolia Yihua Chemical Co., Ltd. 7. Baotou Haipingmian Polymer Industry Co., Ltd. <p>Two supervisory inspections were conducted on the running of low-mercury BAT/BEP in the VCM production enterprises. In June 2021, a supervisory inspection was conducted in Baotou Haipingmian Polymer Industry Co., Ltd in Inner Mongolia province. In September 2021, a supervisory inspection was made in Henan province to investigate the application and high efficient use of low-mercury-catalyst of the 4 PVC plants, including Haohuayuhang Chemical Co., Ltd - a promotional plant in first batch.</p> <p>- Mercury-free technology replication: the replication will be carried out in 2024-2025 once the evaluation activity concludes. See details of the mercury-free evaluation activity in Output 2.2.</p> |
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Component 3 –Promote the recovery of mercury from mercury-containing waste from VCM production

Outcome 3: Promote the recovery of mercury from mercury-containing waste in VCM production process.

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| Output 3.1: Development of a national inventory for high-mercury-containing waste | A national inventory of mercury-containing waste in the VCM sector | Lack of mercury flow information and mercury-containing waste inventory in the VCM sector | 1 | <p>- 60% of the activities under this output have been completed and target for this output has been achieved by FY23.</p> <p>- In November 2021, PRTR study sub-project targeting all PVC plants has finalized its phases and fulfilled its work content, including an international Hg PRTR study, a status study on Hg prevention and control policy and management in China, and to establish Hg PRTR guidelines in coal-based PVC production sector. Combined with 19 key provinces sub-project, all PVC plants have already completed the PRTR work. Administrative measures on PRTR registration (PRTR technical guidance) have been developed for the VCM sector.</p> <p>- In April 2022, FECO carried out the sub-project of Environmentally Sound Management (ESM) of Mercury-containing wastes through RFP, including the following tasks:</p> |
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| | | | | <p>(i) PRTR and field research conducted in at least 15 VCM enterprises, characterization of the situation of mercury-containing waste generation from the CCM VCM process.</p> <p>(ii) Sampling, analysis and waste characterization of mercury-containing waste in the VCM sector.</p> <p>(iii) A national mercury waste inventory of the PVC industry established based on a combination of field research and questionnaire survey.</p> <p>Due to Covid-19, in 2022, it was hard to conduct on-site investigation, which has been postponed so far. Recently, FECO has just received the draft report on the ESM sub-project from the the Chinese Research Academy of Environmental Sciences (CRAES) and the report is currently under review and discussion for final validation.</p> <p>- In 2022, except for those in Guizhou province, the PRTR was implemented in mercury catalyst manufacturing and recycling plants through capacity building in 19 provinces. The project team plans to work with Guizhou province in 2023 to ensure PRTR implemented in all mercury catalyst manufacturing and recycling plants.</p> |
| Output 3.2: Mercury recovery rate enhanced on mercury-containing waste nationwide | Recovery of 90% of the mercury from waste mercury catalyst and waste activated carbon | Lack of effective mercury management and properly guided mercury recovery practices | 1 | <p>-60% of the activities under this output have been completed and target for this output has been achieved by FY23.</p> <p>- On August 31, 2022, FECO published the RFP for Modification Activity of Waste Mercury Catalyst Recycling Plants.</p> <p>In October 2022, FECO held an expert meeting to review and evaluate the applications and implementation plans from 5 waste catalyst recyclers received through the RFP. Some common problems in the application materials of these companies were identified. Subsequently, FECO held one (01) communication meeting with the waste catalyst recyclers to clarify these common issues. After the communication meeting, all key points were made clear to the waste catalyst recyclers.</p> <p>In November 2022, the recyclers adjusted and re-submitted their application materials. FECO held the second expert meeting to re-assess the applications which were scored by the experts. Three recyclers with the highest scores have been selected to participate in the technical modification activity but have to revise the implementation plans based on experts' suggestions. Only 2 of the 3 plants agreed to revise their implementation plans and started to negotiate the contracts. The other one withdrew their application despite repeated encouragement to participate from FECO.</p> <p>In April 2023, FECO carried out the contract negotiation and signed the contracts with the 2 selected waste catalyst recyclers. The names, locations, and mercury-containing waste recycling capacity of the recycling plants are as follows:</p> <p>(1) Guizhou Gravity Technology Environmental Protection CO., LTD.; location: Mayintang, Dalong Economic Development Zone, Tongren City, Guizhou Province, China; mercury-containing catalyst recycling capacity: 8000 tons;</p> <p>(2) Guizhou Wanshan Tianye Green Technology Co., LTD.; location: Zhangjiawan Mercury Industrial Park, Wanshan District, Tongren City, Guizhou Province, China; mercury-containing catalyst recycling capacity: 12000 tons.</p> <p>Both recycling plants are located in Guizhou province, the largest waste recycling area of China.</p> <p>- The ESM sub-project (under Output 3.1) is carrying out a technical evaluation and developing the technical guidance for ESM technologies of mercury-contaminated wastes in the CCM-VCM industry.</p> <p>- Since Q1 2023, Shanghai Greenment Environmental Technology Co. has been undertaking the Environmental and</p> |

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| | | | | <p>Social Safeguards for Mercury-containing Wastes and Mercury-contaminated Sites. The goal is to carry out an E&S impact evaluation on the technical modification activity of waste mercury catalyst recycling plants. In June 2023, Greenment conducted on-site investigations in the two catalyst recycling plants on their modification progress.</p> <p>- China National Cleaner Production Center (CNCPC) has been carrying out the clean production audit in waste mercury recycling plants since April 2022, to investigate the status quo of cleaner production in these plants and measures of mercury pollution prevention and control in the recycling process. Due to Covid-19 in 2022, it was hard to conduct on-site investigation, which has been postponed until now. Recently, FECO has just received the draft report on the cleaner production sub-project from the CNCPC and the report is currently under review and discussion for final validation.</p> |
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Component 4 –Contaminated site identification and risk reduction associated with VCM production

Outcome4 : Appropriate strategies developed for identifying and assessing mercury-contaminated sites from VCM production

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| Output 4.1: Inventory of mercury-contaminated sites developed from VCM production plants | Establishment of the national contaminated site inventory of the VCM industry. | Lack of a national mercury-contaminated site inventory of the VCM industry | 1 | <p>- 100% of the activities under this output have been completed and target for this output has been achieved by FY23.</p> <p>- The Contaminated site sub-project has investigated 99 catalyst manufactures, PVC plants, and waste catalyst recycling plants in the CCM-VCM sector. The investigation finds out that 2 plants were shut down and 97 of them are still in production. Based on the collected data and research on the typical contaminated sites, the screening principle for contaminated sites which need priority control was established.</p> <p>- From March to May 2022, FECO held several validation meetings and invited experts to discuss and improve the Report on Investigation and Identification of Potential Mercury-contaminated Sites in the CCM-VCM Industry. The report includes management ideas and strategies, and schemes and suggestions for risk characterization, control and mitigation.</p> <p>- Since March 2023, the Technical Centre for Soil, Agriculture and Rural Ecology and Environment, Ministry of Ecology and Environment (Soil Centre) has undertaken the tasks on contaminated site screening, including: (i) Develop screening principle and indicator system for typical mercury-contaminated sites in CCM-VCM sector based on the identified mercury-contaminated sites inventory; (ii) Select two typical mercury-contaminated sites as objects for the development of typical mercury-contaminated site remediation plan. The Soil Centre is screening 2 typical contaminated-sites using a state-level soil environment information platform. Currently, FECO is following up on the screening progress and preparing for the preliminary risk assessment activity.</p> |
| Output 4.2: Preliminary risk assessment (level and scope) on typical mercury-contaminated sites from VCM production | EIA conducted in mercury-contaminated sites of VCM sector | Lack of the experience on the risk assessment of mercury-contaminated sites in the VCM sector. | 2 | FECO plans to carry out this activity in the second half of 2023, after the 2 typical mercury-contaminated sites was selected by the Soil Centre. |
| Output 4.3: Strategy proposal for the reduction of the health risk and environmental impact and remediation | Development of technical guidelines for mercury pollution sites in the VCM industry. | Lack of effective management of mercury-contaminated sites in the VCM sector. | 1 | To be developed in FY24-25. |

Component 5 –Information dissemination and awareness raising among stakeholders

Outcome 5: Promotion of knowledge, experience and lesson sharing and environmental awareness raising among stakeholder groups

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| Output 5.1: Training provided to disseminate project results (concerning component 1, 2, 3); | Training, workshops and other activities organized to exchange experience and knowledge gain from the project | Lack of effective stakeholder participation in the mercury pollution control actions | 2 | <p>- 100% of the activities under this output have been completed and target for this output has been achieved by FY23.</p> <p>- FECO carried out trainings in Henan and Inner Mongolia in August 2022 and in Ningxia in March 2023 on the use of mercury in terms of per unit production and technical modification progress, and provided technical support based on the success of the four pilot plants.</p> <p>- In May 2022, FECO assisted Inner Mongolia province to hold information exchange meeting on MC implementation and to raise awareness on MC by explaining relevant requirements of the Convention in detail.</p> |
| Output 5.2: Raise awareness among government, private and civil society stakeholder groups; | Number of stakeholders involved in the project activities | Lack of training and information dissemination on knowledge of mercury pollution and its negative effects on human health and the environment | 2 | <p>- 100% of the activities under this output have been completed and target for this output has been achieved by FY23.</p> <p>- Awareness raising materials have been provided to the environmental departments in 19 provinces.</p> <p>- On June 5, 2023, Xinjiang, Inner Mongolia, Henan and Shandong provinces have conducted awareness raising activity to the public.</p> <p>- On June 8, 2023, FECO attended the Workshop on Counterparts Capacity Building for UNIDO's Project in China, which was held by CICETE and UNIDO Regional Office in Beijing (China, DPR Korea, and Mongolia).</p> |

III. Project Risk Management

1. Please indicate the overall project-level risks and the related risk management measures: (i) as identified in the CEO Endorsement document, and (ii) progress to-date. Please expand the table as needed.

| | (i) Risks at CEO stage | (i) Risk level FY 22 | (i) Risk level FY 23 | (i) Mitigation measures | (ii) Progress to-date | New defined risk ⁵ |
|---|---|----------------------|----------------------|--|--|-------------------------------|
| 1 | Key agencies and stakeholders might not attach sufficient importance and allocate sufficient resources to mercury supervision | Low | Low | Focus on stakeholder awareness-raising as a priority. | All project activities have carried out relevant awareness raising activity on mercury supervision, involving relevant stakeholders, especially for capacity building, low-mercury pilot and promotional activities. | <input type="checkbox"/> |
| 2 | NGOs and enterprises might not be willing to participate in outreach activities | Low | Low | Raise public awareness and provide sufficient training | Through knowledge management and awareness raising, VCM production enterprises nationwide and at provincial levels have demonstrated knowledge on mercury reduction. Knowledge sharing materials are updated and published on the website of http://www.mercury.org.cn/ . | <input type="checkbox"/> |
| 3 | Mercury catalyst producers might not be willing to recycle the mercury and transfer to low mercury catalyst production | Low | Low | A policy for extended mercury producer responsibility will be issued and enhanced monitoring will be implemented under the support of industry associates. | As hazardous waste, waste mercury catalyst is restricted in transferring between regions by Hazardous Waste Transfer System, given mercury is valuable in market and mercury catalyst production consumes a large amount of mercury, research shows that a | <input type="checkbox"/> |

⁵ New risk added in reporting period. Check only if applicable.

| | | | | | | |
|---|---|-----|-----|--|---|--------------------------|
| | | | | | <p>considerable amount of mercury is recycled and going to the mercury catalyst production sector.</p> <p>There are 2 waste catalyst recycling plants under the VCM project which will conduct technology modification to promote environmentally sound disposal of mercury-containing wastes. Through technical modification and enhancing management capacity in waste catalyst recycling plants, this activity aims to improve the mercury recovery efficiency, reduce the emission and release of mercury to the environment, and reduce the dependence on primary mercury mines.</p> | |
| 4 | Delayed demonstration of mercury-free alternatives in VCM sector due to higher cost than expected and low efficiency. | Low | Low | A policy for extended mercury producer responsibility will be issued and enhanced monitoring will be implemented under the support of industry associates. | <p>MEE, FECO and local environmental departments have attached great importance to the mercury-free alternatives, and have actively carried out research on the mercury-free application status nationwide, encouraging VCM plants to pay greater attention on the MC negotiation progress, understand the pressure on the mercury-free process in China, and facilitate mercury-free alternative technology testing with forward-looking vision.</p> <p>The mercury-free evaluation activity has been carried out, participated by 8 test units from 5 PVC plants. And after the mercury-free evaluation, it is planned to carry out mercury-free demonstration to verify the selected mercury-free technology from the 4 key points of the MC to assess its potential of promotion and replication in the whole industry.</p> | <input type="checkbox"/> |
| 5 | Climate change might affect the implementation of project activities | Low | Low | Climate change scenarios will be taken into consideration for all selected facilities | The calcium carbide-method VCM production is high-energy consumption. With China's carbon peak and carbon emission reduction targets being carried out, China's chemical industry has issued relevant requirements and the PVC industry has taken relevant measures to promote climate change mitigation. | <input type="checkbox"/> |

2. If the project received a **sub-optimal risk rating (H, S)** in the previous reporting period, please state the **actions taken** since then to mitigate the relevant risks and improve the related risk rating. Please also elaborate on reasons that may have impeded any of the sub-optimal risk ratings from improving in the current reporting cycle; please indicate actions planned for the next reporting cycle to remediate this.

Not applicable

3. Please indicate any implication of the **COVID-19** pandemic on the progress of the project.

Due to the impact of the Covid-19 epidemic, the submission of progress report on the BAT/BEP replication of some promotional plants was delayed to some extent. Currently, FECO has been following up actively with them to deliver the project reports ASAP. Besides, the activity on environmentally sound management of mercury-containing wastes and on cleaner production audit is still in progress. However, due to the impact of the epidemic, a large number of field research

activities in this work have been delayed, resulting in the slow progress of these activities.

4. Please clarify if the project is facing delays and is expected to request an **extension**.

Not applicable

5. Please provide the **main findings and recommendations of completed MTR**, and elaborate on any actions taken towards the recommendations included in the report.

The midterm review was carried out by a team constituted by an international consultant (team leader) and a national consultant. Given the Covid19 pandemic and travel restriction, the field visits as well as interviews of national key partners and stakeholders were undertaken by the national consultant. UNIDO and the international consultants of the project exchanged through online communication means such Zoom or Skype. The assessment was also based on the in-depth review of project documentation and email communications. Based on the findings of the review and the discussions held, the evaluation came to the following findings.

Relevance: The project is in line with the national strategies of environmental protection in China. In particular, it is very relevant to China's 12th (2011 – 2015), 13th (2016 – 2020), and, 14th (2021 – 2025) Five-Year plans. These plans were/are set for the prevention and control of mercury pollution of Calcium Carbide Process Polyvinyl chloride (CCP PVC), to put an end to production methods of PVC that use a high mercury catalyst for acetylene', and to strictly prevent and control environmental risks management system for toxic and hazardous chemical substances, respectively. The project is consistent with the GEF6 the strategies on Chemicals and Waste: to develop the enabling conditions, tools, and environment to manage harmful chemicals and wastes; and to reduce the prevalence of harmful chemicals and waste and support the implementation of clean alternative technologies/substances.

Effectiveness: Assessment of this criteria was done at three levels: the achievement of outputs and outcomes and progress towards impact (based on the theory of change). The assessment of outputs and outcomes was based on the availability of their respective indicators. The project has performed very satisfactorily for the low mercury technology. At midterm, it has already achieved the targets of mercury reduction by 360 tons and halving mercury catalyst from 98 g to below 49 g per ton of VCM produced. On the other hand, due to technological challenges, it is behind schedule for the mercury free technology. The rating given to the five project outcomes which is directly linked to the extent of delivery of the corresponding outputs, are highly satisfactory, satisfactory, moderately satisfactory, moderately unsatisfactory and unsatisfactory respectively. Progress towards impact is considered quite satisfactory as at midterm three of the five intermediate states proposed by the evaluation for impact are already occurring.

Efficiency: The active involvement of key partners and stakeholders has contributed to an effective implementation of the project during the first two years. However, the restructuring of FECO that was accompanied by a change of the National Project Coordinator, project management changes at UNIDO level, and the COVID-19 pandemic, have disrupted this good start and caused much delays to project implementation. However, there is clear evidence that the project has been using the most efficient options to recruit national experts and international consultants as well as for the sub-contracting of service providers. The materialization of significant amount co-financing is also contributing to the cost effectiveness of the project.

Sustainability: While some financial risks that may jeopardize the project sustainability have been identified, risks regarding the socio-political, institutional and governance, and environmental dimensions are considered low.

Monitoring and evaluation: The monitoring and evaluation system is in place and the set of indicators in the project results framework are being used by the project team for adequate monitoring and evaluation of the implementation process. The planned annual tripartite review meetings have been held. While most of the expected reports such as the project implementation review reports and the annual progress reports (APR) for 2018 and 2019 have been timely submitted, APR for 2020 and most of the yearly financial reports have not been submitted.

Project management: In close collaboration with the interdepartmental coordination group, the efficient project management team, led by a dedicated national project coordinator, is effectively managing the project under the adequate supervision of UNIDO. However, some communication gap between the

implementing and the executing agencies have been noted as from the outbreak of the COVID-19 pandemic.

The overall assessment is moderately satisfactory (the average score is 4 out of 6, where 6 is highly satisfactory, 1 is highly unsatisfactory).

From August 2021 to June 2023, the following actions have taken place to implement the recommendations made by the evaluators:

- A three-year project extension has been requested and granted.
- The execution contract between UNIDO and FECO has been revised to take into account the project extension, the new payment schedule, and the reporting requirements to facilitate in time disbursement of funds.
- Formal and informal communication channels have been renewed and established between UNIDO and FECO project team. Regular email exchanges on the project progress and activities have been made.
- FECO has carried out the Environmental and Social Safeguard to conduct evaluation on the ESMP implementation progress of VCM Project, and on the E&S impacts of engineering activities of technical modification, technical demonstration and site remediation, so as to provide technical support for mitigating potential E&S impacts incurred during the project implementation.
- The international experts have provided technical inputs on the project deliverables, indicators, and data and have been informed of the project progress by UNIDO and FECO project team.
- FECO has recruited additional team members for strengthened supports to the project, and has recruited a National Technical Advisor (NTA) to ensure effective and timely project implementation and in line with the project execution agreement.
- A mission to China was planned for July 2023 for UNIDO Chief of the Circular Economy and Chemicals Management Unit and the Project Manager to meet with FECO colleagues after more than 2 years of no in-person meeting.
- A technical mission will be proposed to take place in Q3 2023 with the participation of the international expert for the consideration of FECO colleagues and authorization of the Government of China.

IV. Environmental and Social Safeguards (ESS)

1. As part of the requirements for **projects from GEF-6 onwards**, and based on the screening as per the UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), which category is the project?

Category A project

Category B project

Category C project

(By selecting Category C, I confirm that the E&S risks of the project have not escalated to Category A or B).

Please expand the table as needed.

| | E&S risk | Mitigation measures undertaken during the reporting period | Monitoring methods and procedures used in the reporting period |
|---|---|--|---|
| (i) Risks identified in ESMP at time of CEO Endorsement | <p>1) During replacing and updating phase:</p> <ul style="list-style-type: none"> Smoke emissions from the use of machines and dust production during the replacing and updating phase could result in annoyance to workers and pedestrians. Noise generation from the use of machines and equipment during the replacing and updating phase posed hazard to workers and pedestrians. Some replacing and updating activities such as the use of cranes, elevated working environments and machines might create health and safety risks for both workers and pedestrians for improper operation or accidents. Risk of inappropriate maintenance and operation of established equipment/ facilities and technology failure, which will result in excessive discharge of pollutants and environmental pollution. <p>2) During pilot demonstration phase:</p> <ul style="list-style-type: none"> Noise resulted from the use of fan, air compressor and pump during pilot demonstration phase could potentially impact workers. Climate change might affect the mobility of mercury to the atmosphere and sea. | <p>During this reporting period (from July 2022.7 to June 2023):</p> <p>For Output 3.2: Mercury recovery rate enhanced on mercury-containing waste nationwide (2 mercury recovery companies participated during this reporting period, both in replacing phase).</p> <ul style="list-style-type: none"> Two third-party consulting companies (Shanghai Greenment Environmental Technology Co., Ltd. & Senman (Chongqing) Environmental Co., Ltd.) were employed to support the E&S safeguard for Output 3.2. Site visit was conducted to the two demonstration companies (Zhongli Technology & Wanshan Tianye) by E&S experts from the consulting companies in June 2023. During the site visit, the E&S experts investigated the E&S management status quo of the two demonstration companies, the stage of the upgrading & replacing activity, identified E&S risks/management issues, and proposed recommendations to site management. ESIA and ESMP for the demonstration activity of the two companies were in preparation. <p>Dust suppression methods were employed as needed to avoid visible dust; effective smoke reduction methods were employed as needed to minimize the emission of smoke; personal protective equipment is required where needed. Safe access and marking of dangerous areas have been provided where equipment upgrading took place. Factory personnel have been provided with proper safety gear, harnesses, etc.</p> <p>For output 2.3 & 2.5 (the 11 pilot and promotional enterprises) mitigation measures has been undertaken as follows:</p> <ul style="list-style-type: none"> The Technical Guide for High-Efficiency Application of Low Mercury Catalyst in the CCM-VCM Sector has been prepared for demonstration enterprises, of which the mercury pollution prevention requirements are one of the most important contents. The use of efficient mercury removers and proper equipment maintenance has reduced mercury emissions to the atmosphere. The multi-stage adsorption process is generally used to recover vinyl chloride, acetylene and hydrogen from the tail gas of vinyl chloride rectification, and the mercury in the gas phase is completely captured. Strengthen the treatment of mercury-containing wastewater and sludge, and basically achieve no wastewater discharge. Solid waste was properly collected and stored for safe disposal. Strengthen the prevention and control of noise, carry out regular monitoring, and keep up with national standards. | <p>The low-mercury promotion company has utilized and carried out technical upgrading by improving overall management system that aligns with the MC requirements.</p> <p>The 11 pilot and promotional enterprises has submitted their monitoring reports, and FECO has carried out on-site investigations within the contract period.</p> <p>Regular monitoring of pollutants was conducted by plants according to the corresponding national and local requirements, and were disclosed on National pollution discharge permit management information platform. There has been a cooperation between FECO and the local EPBs on monitoring relevant plants in line with national and local regulation requirements. In addition, the capacity-building sub-project has required the local authorities to carry out investigation and inspection on mercury-related information in catalyst manufactures, PVC producers, and catalyst recyclers in their jurisdiction.</p> <p>Additionally, for the 2 mercury recovery companies, monitoring plan for the demonstration activity will be proposed in ESMP.</p> <p>For the whole project, the E&S safeguard process report will be formulated once per year by E&S experts from third-party consulting companies.</p> |

| | | | |
|--|-----|-----|-----|
| (ii) New risks identified during project implementation (if not applicable, please insert 'NA' in each box) | N/A | N/A | N/A |
|--|-----|-----|-----|

V. Stakeholder Engagement

1. Using the previous reporting period as a basis, please provide information on **progress, challenges and outcomes** regarding engagement of stakeholders in the project (based on the Stakeholder Engagement Plan or equivalent document submitted at CEO Endorsement/Approval).

The stakeholder involves plants in the CCM-VCM sector, including catalyst manufacturers, PVC production plants and waste catalyst recycling plants, the public surrounding the above mentioned plants, environmental management departments, industrial associations, and NGOs.

During This Monitoring Period (From 1 July 2022 to 30 June 2023)

On MC implementation training and workshop

- FECO carried out trainings in Henan and Inner Mongolia in August 2022 and in Ningxia in March 2023 on the use of mercury in terms of per unit production and technical modification progress, and provided technical support based on the success of the four pilot plants.
- In July 2022 and June 2023, MEE held the National Trainings on Chemical and Environmental Management and Convention Implementation. The sessions were attended by about 1,000 people in 2022 (60 in-person and 940 online, 60% were female) and 2,100 people in 2023 (100 in-person and 2,000 online). Focusing on the prevention and control of environmental risks of chemicals, and elimination of potential environmental risks, this training aimed to promote environmental risk assessment and control of existing chemical substances, strengthen environmental management, and enhance the awareness on the requirements of the MC, and on the mandatory phase-out of mercury-added products and elimination of mercury-used processes.

For waste catalyst recycling plants modification activity

- Focus Group Discussion (FGD) and face-to-face interview with representatives of workers and management of the two waste catalyst recycling companies for technical modification were carried out by the E&S experts in June 2023, involving 19 labors (6 were female).
- 4 communities were visited in June 2023 in Tongren city of Guizhou province. 11 people were interviewed, 7 interviewees were female. Besides, random interview with 10 community residents (2 female) was also undertaken.
- One workshop on the recovery of mercury in mercury-containing waste from VCM production was held in December 2022, involving 12 experts (2 female).

For mercury-free information exchange among stakeholders

- On July 22, 2022, an information exchange meeting was held on mercury-free evaluation activity, joined by 20 people (2 female). During the meeting, association experts, enterprise representatives expressed their concerns and interests in the activity, and shared their opinions and suggestions on the quantitative evaluation indicators.

Stakeholder Engagement Undertaken Previously

- FECO held meetings on January 16, July 4, July 16, 2019, January 9 and January 13, 2020, and invited experts to conduct training on relevant topics. About 60 people attended each meeting and nearly 40% of them were women.
- FECO and UNIDO held 2 meetings in 2018, on January 16, and July 4; held 2 meetings in 2019, January 16 and July 16 respectively. FECO also organized trainings in Beijing on January 9, 2020, and January 13, 2020. About 60 people attended each meeting.
- On June 18, 2021, FECO held the expert workshop on mercury-free technology and Information Exchange Meeting on Mercury-free Technology in PVC Industry, attended by representatives from PVC plants, industrial associations, and R&D units. During the meeting, a lively discussion was made focusing on the activity plan of mercury-free catalysts and alternative technologies evaluation, and requirements and key points from the MC.
- The capacity building sub-project required the environmental management of 19 provinces where PVC plants are located to carry out training on policies and regulations on the MC implementation, the high efficient use of low-mercury catalyst, mercury pollution prevention and control, and to encourage

mercury-free R&D and application for the local PVC plants; and carry out awareness raising activity to the public on the harmfulness of mercury, especially for women and children.

- After the MC entered into force, an interdepartmental coordination mechanism involving 17 ministries on mercury reduction in the VCM sector was established. Annually, a coordination meeting is held to report on the progress of the implementation of Minamata Convention in China. Progress of project 6921 is shared and so far, the National Operational Focal Points, the Ministry of Finance, National Bureau of Statistics, and Ministry of Industry and Information Technology have supported the project.
- During the project implementation process, the project has received support from relative associates such as China Petroleum and Chemical Industry Federation, China Chlor-Alkali Industry Association, and China Chemical Industry Environmental Protection Association, and nation counterparts such as Technical Centre for Soil, Agriculture and Rural Ecology and Environment of Ministry of Ecology and Environment, and Chinese Academy of Environmental Sciences.

2. Please provide any feedback submitted by national counterparts, GEF OFP, co-financiers, and other partners/stakeholders of the project (e.g. private sector, CSOs, NGOs, etc.).

The following feedback is based on the two on-site visits and interviews at the 2 catalyst recycling plants for technical modification in June 2023.

- The companies brought very good benefits to the communities, mainly in job opportunities. As the management of the two pilot companies indicated, 80% of workers are from the local communities.
- There is no negative environment impact created by the companies according to the interview. And there is no residential communities around the companies within 500-meter radius.
- The contact details of the focal points of the companies were disclosed to the communities. There are no grievances raised around the E&S issues of the project companies.

3. Please provide any **relevant stakeholder consultation** documents.

- [The agenda of site visit and stakeholder consultation is available in Annex 1.](#)



PVC汞示范项目现场调研计划rev.doc

- [The records of consultation in two villages are available in Annex 2 and Annex 3.](#)



社区代表现场问卷 - 抚溪村.docx



社区代表现场问卷 - 麻音村.docx

- [The 2022 end-year meeting Agenda and Minute is available in Annex 4.](#)



2022 End-year meeting Agenda

VI. Gender Mainstreaming

1. Using the previous reporting period as a basis, please report on the **progress achieved on implementing gender-responsive measures and using gender-sensitive indicators**, as documented at CEO Endorsement/Approval (in the project results framework, gender action plan or equivalent),.

During This Monitoring Period (From 1 July 2022 to 30 June 2023)

In 2023, safeguard sub-project has been carried out. The following gender mainstreaming progress is based on safeguard of the 2 catalyst recycling plants for technical modification.

Preparation of the Gender Assessment Report (including Gender Action Plan) commenced for two demonstration companies under Output 3.2 (Mercury recovery rate enhanced on mercury-containing waste nationwide) in June 2023. Apart from the collection of basic information and data from the companies, a site visit to the two demonstration companies was undertaken. Interview and focus group discussions (FGDs) with representatives of management, workers, and contractors were carried out. In total, 19 people were interviewed, including 6 females.

The Gender Assessment Report will be submitted to UNIDO through FECO by the end of 2023.

Gender Mainstreaming Progress Made Previously

- In the progress reports submitted by the 4 pilot companies of low-mercury and 7 promotional companies, the gender related qualitative information was analyzed and tracked in 3 promotional companies (Baotou Haipingmian High Polymer Industry, Yihua Chemical of Inner Mongolia and Shandong Lutai Chemical); while there was no related analysis and tracking in the other 8 companies.*
- According to the progress reports submitted by the 11 pilot and promotional companies, the environmental awareness raising and occupational health and safety (OHS) trainings were held each year in every company. 2 promotional companies recorded sex disaggregated data on the training participants. For instance, 18 project team members (7 female) of Baotou Haipingmian High Polymer Industry from Inner Mongolia participated OHS training. 48 training sessions were provided to 4,821 participants on OHS in 2021 and 2022 at Yihua Chemical of Inner Mongolia.*
- According to the progress reports previously prepared by FECO and project companies, Baotou Haipingmian High Polymer Industry from Inner Mongolia did not only analyse the risks of the hazards that are in the working conditions of VCM production but also included the divergence analysis of gender and children. This helped the design of OHS and public awareness training to be much more effective. However, there is no any related qualitative analysis found in the documents prepared by FECO and other related project companies. This good practice should be learned and extended to related documents/deliverables of FECO and other project companies.*

VII. Knowledge Management

1. Using the previous reporting period as a basis, please elaborate on any **knowledge management activities / products**, as documented at CEO Endorsement / Approval.

During This Monitoring Period (From 1 July 2022 to 30 June 2023)

The communications materials are uploaded and managed on the following website: www.mercury.org.cn

Knowledge Management Progress Made Previously

- The knowledge activities / products are embodied in R&D progress of mercury-free catalyst and alternative technology.*
- Under the sub-project of capacity building in 19 key provinces, the project promoted knowledge on the Mercury Convention and improved public awareness on health benefits from mercury exposure.*
- Sharing of the experiences and knowledge to the whole PVC industry gained during the 4 pilot plants phases.*
- In terms of monitoring (NIP project), the project provided relevant technical training to enterprises across PVC industry as well as local EPBs.*

2. Please list any **relevant knowledge management mechanisms / tools** that the project has generated.

Knowledge sharing materials are updated and published on the website of <http://www.mercury.org.cn/>.

See Annex 5-8 for key researches by FY23:

- Annex 5. Report on the Cleaner Production Status of calcium Carbide Method PVC Industry
- Annex 6. Analysis and Research Report on the Materials Flow of Mercury in Typical Enterprises in China.
- Annex 7. Policy Suggestions on the Catalogue for Guiding Industrial Restructuring (the PVC Industry).
- Annex 8. PRTR in the Demonstration Provinces Report.

See below for the Photolog: Stakeholder Engagement and Knowledge Sharing:

Photolog: Stakeholder Engagement and Knowledge Sharing:



Public Engagement Organized by the Provincial Ecological and Environmental Bureau of Inner Mongolia



Public Engagement Organized by the Provincial Ecological and Environmental Bureau of Henan in June 2021



Training and awareness raising for the managerial capacity building for low-mercury and mercury-free in the VCM production sector



Workshop of knowledge sharing for low-mercury and mercury-free in the VCM Production Sector

VIII. Implementation progress

1. Using the previous reporting period as a basis, please provide information on **progress, challenges and outcomes achieved/observed** with regards to project implementation.

Since July 2022, UNIDO as the implementing agency and FECO as the executing agency have closely collaborated, taking necessary steps to incorporate the midterm review recommendations and addressed the key issues and challenges of the project.

Regular communications (online meeting, emails, and text messages at formal and informal level) between FECO and UNIDO as well as with the international experts have fortified the exchanges of information, technical inputs, and recommendations to technical documents and the execution of the project activities. A mission to China has been planned for July 2023 as the first in-person meeting between UNIDO project manager and FECO team after nearly three years of Covid-19 lockdown.

Regarding the project progress, a large number of stakeholders have been involved and greatly supported the project activities. The project has successfully implemented the strategies on the management of current existent and the future mercury-containing wastes. By FY23, the project has achieved moderately satisfactory results and has been extended to 2025. The project has achieved its GEB target: reduction of 360 metric tons of mercury has been secured after the low-mercury technology demonstration. Through intensive capacity building along with public awareness raising and efforts on supervision and enforcement of related national and provincial environmental policies, high-mercury catalyst has been phased out completely. Low-mercury catalyst has been promoted successfully. The evaluation, demonstration, and replication of mercury-free catalyst and alternative technology is ongoing. The evaluation of mercury-free catalysts aims to identify their potential and feasibility for industrial application and promotion, and to serve as a foundation for the 10,000 tons mercury-free demonstration. If the results from the mercury-free catalyst demonstration are positive and the technology modification at mercury-contaminated waste recycling plants

is successful, the project would achieve further reduction of mercury usage and emission.

Key achievements of FY23 include the followings:

- Output 1: 90% of the activities have been completed. Output targets have been reached and exceeded. About 4,500 government officers at the central and local levels were trained on the MC and to coordinate and monitor the VCM production plants. 9 policy recommendations were proposed (2 were adopted and 7 are under discussion).
- Output 2:
 - o A mercury-free expert panel has been setup with representatives from VCM plants and industrial associations. They have provided inputs to assist FECO in the development of key project documents, such as technical evaluation criteria, activity plan.
 - o The incentive mechanism, consisting of monetary benefit to and financial commitment from the private sector, has attracted interests and participation of the VCM plants in the project.
 - o The evaluation of mercury-free catalysts has started with the participation of 5 PVC plants which host 8 test units. Two catalysts (Au and Cu-based) were identified and will be under scrutiny by the expert group. The result of this evaluation will serve as the basis for the technology demonstration and replication.
- Output 3:
 - o The national inventory for high-mercury-containing wastes has been completed.
 - o The PRTR study completed in 2021. Administrative measures on PRTR registration (PRTR technical guidance) have been developed for the VCM sector.
 - o The ESM assessment of mercury-containing wastes is ongoing. The field investigations under this activity have been delayed due to Covid-19.
 - o Two mercury-contaminated waste recyclers have been selected for the technology modification to enhance mercury recover rate.
 - o The China National Cleaner Production Center has been auditing of mercury-containing waste treatment plants.
- Output 4:
 - o The Report on Investigation and Identification of Potential Mercury-contaminated Sites in the CCM-VCM Industry is completed.
 - o The Soil Center (MEE) is screening two typical contaminated sites to complete the national inventory of mercury-contaminated sites developed from VCM production plants. This will serve as the basis for the preliminary risk assessment and contamination remediation strategy.
- Output 5: 100% of activities have been completed. Targets of this output have been exceeded. Training sessions and awareness raising events took place in Henan, Inner Mongolia, Ningxia, Xinjiang, Shandong, and Beijing in 2022 and 2023. Communications materials were distributed to 19 provinces of China.

Challenges:

Covid-19 epidemic and China's "zero COVID" strategy have prevented some field inspection trips from taking place, resulting in the delay of some reports.

Outcomes:

The project team has actively followed up with the responsible plants and contractors on the progress reports. Sharing of information and training materials has been made on the project website and through popular social media platforms in China.

The project has managed to uphold the interests and participation of the VCM plants and relevant local stakeholders to support and to provide their own inputs and contributions to the implementation and finalization of the activities.

2. Please briefly elaborate on any **minor amendments**⁶ to the approved project that may have been introduced during the implementation period or indicate as not applicable (NA).

Please tick each category for which a change has occurred and provide a description of the change in the related textbox. You may attach supporting documentation, as appropriate.

| | | |
|--------------------------|---|----|
| <input type="checkbox"/> | Results Framework | NA |
| <input type="checkbox"/> | Components and Cost | NA |
| <input type="checkbox"/> | Institutional and Implementation Arrangements | NA |
| <input type="checkbox"/> | Financial Management | NA |
| <input type="checkbox"/> | Implementation Schedule | NA |
| <input type="checkbox"/> | Executing Entity | NA |
| <input type="checkbox"/> | Executing Entity Category | NA |
| <input type="checkbox"/> | Minor Project Objective Change | NA |
| <input type="checkbox"/> | Safeguards | NA |
| <input type="checkbox"/> | Risk Analysis | NA |
| <input type="checkbox"/> | Increase of GEF Project Financing Up to 5% | NA |
| <input type="checkbox"/> | Co-Financing | NA |
| <input type="checkbox"/> | Location of Project Activities | NA |
| <input type="checkbox"/> | Others | NA |

3. Please provide progress related to the **financial implementation** of the project.

In FY23, UNIDO disbursed USD 1,800,000 to FECO, resulting in the cumulative disbursement to FECO of USD 9,600,000 as of 30 June 2023 or 64% disbursement rate.

In FY 23, the total disbursement made by the project is USD 1,863,916.38 (excluding obligations), resulting in the cumulative disbursement from the beginning of the project of USD 10,359,885.62 (excluding obligations) as of 30 June 2023 or 64% payment rate.

As of 30 June 2023, the obligations amount to USD 5,413,927.58, resulting in the project total expenditure of USD 15,773,813.20 or 97% expenditure rate. The main expenditures include the project execution agreement with FECO (USD 15,000,000), recruitment of the international experts and project consultants.

As of 30 June 2023, the expenditure of FECO is 39,565,618.55 RMB (6,087,018.24 USD⁷), resulting in the budget execution efficiency of 63%.

⁶ As described in Annex 9 of the *GEF Project and Program Cycle Policy Guidelines*, **minor amendments** are changes to the project design or implementation that do not have significant impact on the project objectives or scope, or an increase of the GEF project financing up to 5%.

⁷ Calculated at the exchange rate of 6.5.



PROJECT DELIVERY REPORT

| | | | | | | | |
|--------------------------|---|-------------------------|--------------------------|---------------------------------|--------------------------------------|------------------------|-------------------------|
| Project: | 140214 - DEMONSTRATION OF MERCURY REDUCTION AND MINIMIZATION IN THE PRODUCTION OF VINYL CHLORIDE MONOMER IN CHINA | Project Manager: | Small Alhaili | Project Validity Status: | 04.08.2014 - 31.12.2025 Implement | | |
| Reporting Period: | 04.10.2017 - 30.06.2023 | Project Theme: | Energy and Environment | Country: | China | | |
| Sponsor Nr. | Sponsor | Grant | Grant Description | Fund | Currency | Grant Status | Grant Validity |
| 400150 | GEF - Global Environment Facility | 2000003735 | CHINA/MERC REDUCTION | GF | USD | Authority to implement | 04.10.2017 - 31.12.2025 |

| | Description | Released Budget Current Year (a) | Obligations Current Year (b) | Disbursements Current Year (c) | Expenditures Current Year (d=b+c) | Total Agreement Budget (e) | Released Budget (f) | Obligations + Disbursements (g) | Funds Available* (h=f-g) | Support Cost (i) | Total Expenditures (j=g+i) |
|----------------|---|----------------------------------|------------------------------|--------------------------------|-----------------------------------|----------------------------|---------------------|---------------------------------|--------------------------|------------------|----------------------------|
| 2000003735 | | | | | | | | | | | |
| 140214-1-01-01 | National regulatory policy developed | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | 4,718.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2100 | Contractual Services | (3.89) | (62,000.00) | 62,000.00 | 0.00 | 0.00 | 0.00 | 3.89 | (3.89) | 0.00 | 3.89 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | 0.35 |
| 140214-1-01-01 | Total | 4,714.70 | (62,000.00) | 62,000.00 | 0.00 | 0.00 | 0.00 | 3.89 | (3.89) | 0.35 | 4.24 |
| 140214-1-01-02 | National managerial capacity strengthened | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | 4,109.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2100 | Contractual Services | (3.89) | (17,000.00) | 17,000.00 | 0.00 | 0.00 | 0.00 | 3.89 | (3.89) | 0.00 | 3.89 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | 0.35 |
| 140214-1-01-02 | Total | 4,105.85 | (17,000.00) | 17,000.00 | 0.00 | 0.00 | 0.00 | 3.89 | (3.89) | 0.35 | 4.24 |
| 140214-1-02-01 | PPP established to promote R&D | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | 1,517.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-02-01 | Total | 1,517.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-02-02 | ETV methodology established | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | (7.42) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2100 | Contractual Services | (3.89) | (1,000.00) | 1,000.00 | 0.00 | 0.00 | 0.00 | 3.89 | (3.89) | 0.00 | 3.89 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | 0.35 |
| 140214-1-02-02 | Total | (11.31) | (1,000.00) | 1,000.00 | 0.00 | 0.00 | 0.00 | 3.89 | (3.89) | 0.35 | 4.24 |

| | Description | Released Budget Current Year (a) | Obligations Current Year (b) | Disbursements Current Year (c) | Expenditures Current Year (d=b+c) | Total Agreement Budget (e) | Released Budget (f) | Obligations + Disbursements (g) | Funds Available* (h=f-g) | Support Cost (i) | Total Expenditures (j=g+i) |
|----------------|---------------------------------------|----------------------------------|------------------------------|--------------------------------|-----------------------------------|----------------------------|---------------------|---------------------------------|--------------------------|------------------|----------------------------|
| 140214-1-02-03 | Demonstration of low-mercury BAT/BEPs | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | (697.95) | (2,769.02) | 5,595.72 | 2,826.70 | 0.00 | 0.00 | 3,082.54 | (3,082.54) | 0.00 | 3,082.54 |
| 1500 | Local Travel | 4,285.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2100 | Contractual Services | (3.89) | (520,000.00) | 520,000.00 | 0.00 | 0.00 | 0.00 | 3.89 | (3.89) | 0.00 | 3.89 |
| 5100 | Other Direct Costs | (307.56) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 277.74 | 277.74 |
| 140214-1-02-03 | Total | 3,275.73 | (522,769.02) | 525,595.72 | 2,826.70 | 0.00 | 0.00 | 3,086.43 | (3,086.43) | 277.74 | 3,364.17 |
| 140214-1-02-04 | Incentive program designed | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 2100 | Contractual Services | (7.79) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.79 | (7.79) | 0.00 | 7.79 |
| 5100 | Other Direct Costs | 85.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.70 | 0.70 |
| 140214-1-02-04 | Total | 77.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.79 | (7.79) | 0.70 | 8.49 |
| 140214-1-02-05 | Replication of BAT/BEPs | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | 8,033.73 | 7,212.65 | 10,184.36 | 17,397.01 | 0.00 | 0.00 | 16,944.17 | (16,944.17) | 0.00 | 16,944.17 |
| 1700 | Nat.Consult./Staff | (60.96) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 60.96 | (60.96) | 0.00 | 60.96 |
| 2100 | Contractual Services | 24.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.89 | (3.89) | 0.00 | 3.89 |
| 5100 | Other Direct Costs | (859.62) | 0.00 | 474.93 | 474.93 | 0.00 | 0.00 | 1,334.55 | (1,334.55) | 0.00 | 1,334.55 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,650.88 | 1,650.88 |
| 140214-1-02-05 | Total | 7,137.98 | 7,212.65 | 10,659.29 | 17,871.94 | 0.00 | 0.00 | 18,343.57 | (18,343.57) | 1,650.88 | 19,994.43 |
| 140214-1-03-01 | Development of a national inventory | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | 34.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2100 | Contractual Services | (3.89) | (313,285.00) | 313,285.00 | 0.00 | 0.00 | 0.00 | 3.89 | (3.89) | 0.00 | 3.89 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | 0.35 |
| 140214-1-03-01 | Total | 30.41 | (313,285.00) | 313,285.00 | 0.00 | 0.00 | 0.00 | 3.89 | (3.89) | 0.35 | 4.24 |

| | Description | Released Budget Current Year (a) | Obligations Current Year (b) | Disbursements Current Year (c) | Expenditures Current Year (d=b+c) | Total Agreement Budget (e) | Released Budget (f) | Obligations + Disbursements (g) | Funds Available* (h=f-g) | Support Cost (i) | Total Expenditures (j=g+i) |
|----------------|--|----------------------------------|------------------------------|--------------------------------|-----------------------------------|----------------------------|---------------------|---------------------------------|--------------------------|------------------|----------------------------|
| 140214-1-03-02 | Mercury recovery rate enhanced | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | 623.49 | (1,907.00) | 3,887.02 | 1,980.02 | 0.00 | 0.00 | 2,172.97 | (2,172.97) | 0.00 | 2,172.97 |
| 1500 | Local Travel | 4,148.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2100 | Contractual Services | 0.00 | (218,715.00) | 218,715.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5100 | Other Direct Costs | 2,056.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 195.60 | 195.60 |
| 140214-1-03-02 | Total | 6,828.22 | (220,622.00) | 222,582.02 | 1,960.02 | 0.00 | 0.00 | 2,172.97 | (2,172.97) | 195.60 | 2,368.57 |
| 140214-1-04-01 | Inventory of Hg-contaminated sites devel | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 2100 | Contractual Services | 0.00 | (45,000.00) | 45,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5100 | Other Direct Costs | 76.71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-04-01 | Total | 76.71 | (45,000.00) | 45,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-04-02 | Preliminary risk assessment conducted | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | 4,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2100 | Contractual Services | 0.00 | (355,000.00) | 355,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5100 | Other Direct Costs | 76.71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-04-02 | Total | 4,076.71 | (355,000.00) | 355,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-04-03 | Strategy proposal prepared | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | 8,288.95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2100 | Contractual Services | 0.00 | (30,000.00) | 30,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5100 | Other Direct Costs | 170.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-04-03 | Total | 8,439.06 | (30,000.00) | 30,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | Description | Released Budget Current Year (a) | Obligations Current Year (b) | Disbursements Current Year (c) | Expenditures Current Year (d=b+c) | Total Agreement Budget (e) | Released Budget (f) | Obligations + Disbursements (g) | Funds Available* (h=f-g) | Support Cost (i) | Total Expenditures (j=g+i) |
|----------------|----------------------------------|----------------------------------|------------------------------|--------------------------------|-----------------------------------|----------------------------|---------------------|---------------------------------|--------------------------|------------------|----------------------------|
| 140214-1-05-01 | Training provided | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | 625.43 | 6,714.87 | 6,629.17 | 13,344.04 | 0.00 | 0.00 | 14,903.17 | (14,903.17) | 0.00 | 14,903.17 |
| 2100 | Contractual Services | 0.00 | (28,000.00) | 28,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5100 | Other Direct Costs | (64.30) | 0.00 | 165.18 | 165.18 | 0.00 | 0.00 | 229.48 | (229.48) | 0.00 | 229.48 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,361.94 | 1,361.94 |
| 140214-1-05-01 | Total | 561.13 | (21,285.13) | 34,794.35 | 13,509.22 | 0.00 | 0.00 | 15,132.65 | (15,132.65) | 1,361.94 | 16,494.59 |
| 140214-1-05-02 | Awareness raised | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | 1,133.95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2100 | Contractual Services | 0.00 | (15,000.00) | 15,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-05-02 | Total | 1,133.95 | (15,000.00) | 15,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-51-01 | Project Management Costs | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 2100 | Contractual Services | 0.00 | (155,000.00) | 155,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-51-01 | Total | 0.00 | (155,000.00) | 155,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-53-01 | Periodic monitoring | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 2100 | Contractual Services | 0.00 | (30,000.00) | 30,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-53-01 | Total | 0.00 | (30,000.00) | 30,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-53-02 | Mid-term and terminal evaluation | USD | USD | USD | USD | USD | USD | USD | USD | USD | USD |
| 1100 | Staff & Intern Consultants | 2,108.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1500 | Local Travel | 1,901.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2100 | Contractual Services | 0.00 | (10,000.00) | 10,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5100 | Other Direct Costs | 77.84 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9300 | Support Cost IDC | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140214-1-53-02 | Total | 4,087.35 | (10,000.00) | 10,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2000003735 | Total | 46,050.82 | (1,790,748.50) | 1,826,916.38 | 36,167.88 | 0.00 | 0.00 | 38,758.97 | (38,758.97) | 3,488.24 | 42,247.21 |

IX. Work Plan and Budget

1. Please provide an updated project work plan and budget for the remaining duration of the project, as per last approved project extension. Please expand/modify the table as needed.

Please fill in the below table or make a reference to a file, in case it is submitted as an annex to the report.

| Outputs by Project Component | Year 6 - 2023 | | Year 7- 2024 | | | | Year 8 - 2025 | | | | GEF Grant Budget Available (US\$) |
|---|---------------|--------|--------------|--------|---------|--------|---------------|---------|---------|---------|-----------------------------------|
| | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | |
| Component 1 – | | | | | | | | | | | |
| Outcome 1: | | | | | | | | | | | |
| Output 1.1: Develop national supervision policy and framework to reduce or eliminate the consumption of mercury in VCM production, especially the compulsory policy on prohibition the use of high-level mercury catalyst | 30,000 | 20,000 | 20,000 | 25,000 | 12,000 | 5,500 | 12,500 | 25,000 | 20,000 | 25,000 | 195,000 |
| Output 1.2: Strengthen national management and law enforcement capacity to coordinate and monitor VCM manufacturing enterprises | 7,000 | 10,000 | 12,000 | 6,000 | 4,000 | 11,000 | 9,000 | 11,000 | 10,000 | 10,000 | 90,000 |
| Component 2 – | | | | | | | | | | | |
| Outcome 2: | | | | | | | | | | | |
| Output 2.1: Establish public private partnership (PPP) mechanism, promote R&D, venture capital investment and technology transfer; | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Output 2.2: Environmental Technology Verification (ETV) methodology established to verify the performance of low-mercury and mercury-free alternatives by an expert panel established; | 0 | 0 | 0 | 24,000 | 0 | 23,000 | 0 | 0 | 0 | 2,000 | 49,000 |
| Output 2.3. Demonstration | 0 | 0 | 430,000 | 0 | 560,000 | 0 | 385,000 | 385,000 | 385,000 | 385,000 | 2,530,000 |

| | | | | | | | | | | | | |
|--|--------|---------|---------|---------|-----------|---------|--------|---------|--------|--------|---|-----------|
| low mercury BAT/BEPs in 4 coal-based VCM companies and of mercury-free alternatives in a coal-based VCM company; | | | | | | | | | | | | |
| Output 2.4. Incentive program designed and implementation of major green instruments (fiscal, monetary, venture capital, insurance etc.) to allow the private sectors to access the technologies and experience gained from demonstration; | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Output 2.5. Replication of BAT/BEPs and of feasible mercury-free alternatives in 15 coal-based VCM companies national wide; | 0 | 0 | 980,000 | 0 | 1,104,000 | 0 | 0 | 0 | 0 | 0 | 0 | 2,084,000 |
| Component 3 – | | | | | | | | | | | | |
| Outcome 3: | | | | | | | | | | | | |
| Output 3.1: Establish an inventory of mercury wastes | 60,000 | 100,000 | 50,000 | 50,000 | 40,000 | 50,000 | 85,000 | 66,000 | 73,000 | 56,000 | | 630,000 |
| Output 3.2: Improve the Hg- recovery rate of mercury wastes | 80,000 | 70,000 | 0 | 280,000 | 0 | 300,000 | 0 | 0 | 0 | 0 | | 730,000 |
| Component 4 – | | | | | | | | | | | | |
| Outcome 4: | | | | | | | | | | | | |
| Output 4.1. Establish the inventory of Hg-contaminated sites caused by VCM production | 4,000 | 3,000 | 4,000 | 1,000 | 3,000 | 4,000 | 3,000 | 3,000 | 3,000 | 2,000 | | 30,000 |
| Output 4.2. Conduct the preliminary risk evaluation on typical Hg-contaminated sites caused by VCM production (degree and area of contamination) : | 80,000 | 40,000 | 55,000 | 52,000 | 58,000 | 105,000 | 86,000 | 158,000 | 86,000 | 40,000 | | 760,000 |
| Output 4.3. Make strategy to reduce the risk on health and environment, and remediation of the contaminated sites | 8,000 | 7,000 | 15,000 | 7,000 | 8,000 | 5,000 | 11,000 | 6,000 | 8,000 | 5,000 | | 80,000 |
| Component 5 – | | | | | | | | | | | | |

| Outcome 5: | | | | | | | | | | | |
|--|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|---------|
| Output 5.1: Training provided to disseminate project results (concerning component 1, 2,3); | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Output 5.2: Awareness raised among government, private and civil society stakeholder groups. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Component 6 – | | | | | | | | | | | |
| Outcome 6: | | | | | | | | | | | |
| Output 6.1: Periodic monitoring and evaluation; | 0 | 5,000 | 0 | 5,000 | 4,000 | 10,000 | 10,000 | 24,000 | 35,000 | 32,000 | 125,000 |
| Output 6.2 Mid-term and terminal evaluation report; | 1,000 | 2,000 | 3,000 | 1,000 | 3,000 | 1,000 | 3,000 | 2,000 | 3,000 | 1,000 | 20,000 |

X. Synergies

1. Synergies achieved:

The Mercury Initiative Assessment project in China found that about 800-1200 t mercury were emitted by the coal-fired PVC production sector during 2010-2014, accounting for more than 50% of total mercury use in China, therefore, the VCM sector was selected as a priority sector for mercury use and emission reduction. The project have formed synergies through the below mentioned media:

- Synergy achieved with MIA project was embodied in the learning of Checklist methodology and implementation of the sub-project of capacity building in 19 key provinces;
- Synergy was gained from the NIP project;
- Synergy was also gained from the China-Norway project on Mercury;
- Exchanges of information and synergies guaranteed with World Bank project (Capacity Strengthening For Implementation Of Minamata Convention On Mercury in China).

3. Stories to be shared (Optional)

Not applicable for FY2023.

XI. GEO LOCATION INFORMATION

The Location Name, Latitude and Longitude are required fields insofar as an Agency chooses to enter a project location under the set format. The Geo Name ID is required in instances where the location is not exact, such as in the case of a city, as opposed to the exact site of a physical infrastructure. The Location & Activity Description fields are optional. Project longitude and latitude must follow the Decimal Degrees WGS84 format and Agencies are encouraged to use at least four decimal points for greater accuracy. Users may add as many locations as appropriate.

Web mapping applications such as [OpenStreetMap](#) or [GeoNames](#) use this format. Consider using a conversion tool as needed, such as: <https://coordinates-converter.com>

Please see the Geocoding User Guide by clicking [here](#)

| Location Name | Latitude | Longitude | Geo Name ID | Location and Activity Description |
|---|--------------|---------------|----------------|---|
| <i>China- Guizhou Province, Tongren City- Guizhou Gravity Technology Environmental Protection CO., LTD.</i> | <i>27.33</i> | <i>109.01</i> | <i>1809445</i> | <i>Mercury-containing waste recycling plant Mayintang, Dalong Economic Development Zone, Tongren City, Guizhou Province, China</i> |
| <i>China- Guizhou Province, Tongren City- Guizhou Wanshan Tianye Green Technology Co., LTD.</i> | <i>27.51</i> | <i>109.22</i> | <i>1809445</i> | <i>mercury-containing waste recycling plant Zhangjiawan Mercury Industrial Park, Wanshan District, Tongren City, Guizhou Province, China</i> |
| <i>China- Shaanxi Province, Yulin City- Shaanxi Beiyuan Group Co., Ltd.</i> | <i>38.74</i> | <i>110.20</i> | <i>1785769</i> | <i>Pilot plant Jinjie Industrial Park, Shenmu City, Yulin, Shaanxi Province, China</i> |
| <i>China- Inner Mongolia Autonomous Region, Ordos City- Inner Mongolia Ordos Group Co., Ltd</i> | <i>39.37</i> | <i>107.01</i> | <i>8347664</i> | <i>Pilot plant Tictactoe Industrial Park, Toke Banner, Ordos City, Inner Mongolia Autonomous Region, China</i> |
| <i>China- Xinjiang Uygur Autonomous Region, Urumqi City- Xinjiang Zhongtai Chemical Co., Ltd</i> | <i>43.84</i> | <i>87.50</i> | <i>1529102</i> | <i>Pilot plant No. 39 Yangchenghu Road, Economic and Technological Development Zone, Urumqi, Xinjiang Uygur Autonomous Region, China</i> |
| <i>China- Xinjiang Uygur Autonomous Region, Shihezi City- Tianneng Chemical Co., Ltd</i> | <i>44.33</i> | <i>86.06</i> | <i>1529195</i> | <i>pilot plant No.36, Beisan East Road,</i> |

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|---|-------|--------|---------|--|--|
| | | | | | Shihezi Development Zone, Xinjiang Uygur Autonomous Region, China. |
| China- Inner Mongolia Autonomous Region, Baotou City- Haipingmian Polymer Industry Co., Ltd. | 40.60 | 109.78 | 2038432 | | promotional plant Hope Industrial Park, Baotou rare Earth High-tech Zone, Inner Mongolia Autonomous Region, China |
| China- Inner Mongolia Autonomous Region, Wuhai City- Inner Mongolia Yihua Chemical Co., Ltd | 39.47 | 106.72 | 1791249 | | promotional plant Wuda Industrial Park, Wuhai City, Inner Mongolia Autonomous Region, China |
| China- Ningxia Hui Autonomous Region, Shizuishan City- Ningxia Younglight Chemical Co.Ltd | 39.30 | 106.73 | 1794806 | | promotional plant No. 41, Gangdian Road, Huinong District, Shizuishan City, Ningxia Hui Autonomous Region, China |
| China- Shandong Province, Jining City- Shandong Lutai Chemical Co., Ltd. | 35.09 | 116.58 | 1805518 | | promotional plant Zhanghuang Industrial Park, Yutai District, Jining City, Shandong Province, China |
| China- Shaanxi Province, Yulin City- Shaanxi Jintai Chlor-Alkali Chemical Co., Ltd. | 38.74 | 110.22 | 1785769 | | promotional plant NO.1, Jintai Road, Mizhi District, Yulin City, Shaanxi Province, China |
| China- Xinjiang Uygur Autonomous Region, Shihezi City- Shihezi Tianyu Xinshi Chemical Co., Ltd. | 44.36 | 86.09 | 1529195 | | promotional plant No.2, North 15th Road, Shihezi City, Xinjiang Uygur Autonomous Region, China |
| China-Henan Province, Qinyang City- Haohuayuhang Chemical Co., Ltd. | 35.25 | 113.28 | 1797556 | | promotional plant Qinbei industrial Cluster, Qinyang |

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|--|--|--|--|--|
| | | | | <i>City, Henan Province, China</i> |
|--|--|--|--|--|

Please provide any further geo-referenced information and map where the project interventions is taking place as appropriate.

Not applicable

EXPLANATORY NOTE

1. **Timing & duration:** Each report covers a twelve-month period, i.e. 1 July 2022 – 30 June 2023.
2. **Responsibility:** The responsibility for preparing the report lies with the project manager in consultation with the Division Chief and Director.
3. **Evaluation:** For the report to be used effectively as a tool for annual self-evaluation, project counterparts need to be fully involved. The (main) counterpart can provide any additional information considered essential, including a simple rating of project progress.
4. **Results-based management:** The annual project/programme progress reports are required by the RBM programme component focal points to obtain information on outcomes observed.

| Global Environmental Objectives (GEOs) / Development Objectives (DOs) ratings | |
|---|---|
| Highly Satisfactory (HS) | Project is expected to achieve or exceed <u>all</u> its major global environmental objectives, and yield substantial global environmental benefits, without major shortcomings. The project can be presented as “good practice”. |
| Satisfactory (S) | Project is expected to <u>achieve most</u> of its <u>major</u> global environmental objectives, and yields satisfactory global environmental benefits, with only minor shortcomings. |
| Moderately Satisfactory (MS) | Project is expected to <u>achieve most</u> of its major <u>relevant</u> objectives but with either significant shortcomings or modes overall relevance. Project is expected not to achieve some of its major global environmental objectives or yield some of the expected global environmental benefits. |
| Moderately Unsatisfactory (MU) | Project is expected to achieve <u>some</u> of its major global environmental objectives with major shortcomings or is expected to <u>achieve only some</u> of its major global environmental objectives. |
| Unsatisfactory (U) | Project is expected <u>not</u> to achieve <u>most</u> of its major global environmental objectives or to yield any satisfactory global environmental benefits. |
| Highly Unsatisfactory (HU) | The project has failed to achieve, and is not expected to achieve, <u>any</u> of its major global environmental objectives with no worthwhile benefits. |

| Implementation Progress (IP) | |
|---------------------------------------|---|
| Highly Satisfactory (HS) | Implementation of <u>all</u> components is in substantial compliance with the original/formally revised implementation plan for the project. The project can be presented as “good practice”. |
| Satisfactory (S) | Implementation of <u>most</u> components is in substantial compliance with the original/formally revised plan except for only few that are subject to remedial action. |
| Moderately Satisfactory (MS) | Implementation of <u>some</u> components is in substantial compliance with the original/formally revised plan with some components requiring remedial action. |
| Moderately Unsatisfactory (MU) | Implementation of <u>some</u> components is <u>not</u> in substantial compliance with the original/formally revised plan with most components requiring remedial action. |
| Unsatisfactory (U) | Implementation of <u>most</u> components in <u>not</u> in substantial compliance with the original/formally revised plan. |
| Highly Unsatisfactory (HU) | Implementation of <u>none</u> of the components is in substantial compliance with the original/formally revised plan. |

| Risk ratings | |
|--|---|
| Risk ratings will assess the overall risk of factors internal or external to the project which may affect implementation or prospects for achieving project objectives. Risk of projects should be rated on the following scale: | |
| High Risk (H) | There is a probability of greater than 75% that assumptions may fail to hold or materialize, and/or the project may face high risks. |
| Substantial Risk (S) | There is a probability of between 51% and 75% that assumptions may fail to hold or materialize, and/or the project may face substantial risks. |
| Moderate Risk (M) | There is a probability of between 26% and 50% that assumptions may fail to hold or materialize, and/or the project may face only moderate risk. |
| Low Risk (L) | There is a probability of up to 25% that assumptions may fail to hold or materialize, and/or the project may face only low risks. |