



Project Implementation Report

(1 July 2021 – 30 June 2022)

Project Title:	Global Environment Facility-Improvement of the environmental performance of the foam sector: Phase out and management of hexabromocyclododecane (HBCD) in China
GEF ID:	10163
UNIDO ID:	180288
GEF Replenishment Cycle:	GEF-7
Country(ies):	China
Region:	EAP - East Asia and Pacific
GEF Focal Area:	Chemicals and Waste (CW)
Integrated Approach Pilot (IAP) Programs¹:	N/A
Stand-alone / Child Project:	N/A
Implementing Department/Division:	ENV / IPM
Co-Implementing Agency:	N/A
Executing Agency(ies):	Foreign Environmental Cooperation Center, Ministry of Ecology and Environment (FECO/MEE) of P.R. China
Project Type:	Full-Sized Project (FSP)
Project Duration:	60 months
Extension(s):	0
GEF Project Financing:	12,600,000 USD
Agency Fee:	1,134,000 USD
Co-financing Amount:	100,140,000 USD
Date of CEO Endorsement/Approval:	2/4/2021
UNIDO Approval Date:	4/7/2021
Actual Implementation Start:	4/22/2021
Cumulative disbursement as of 30 June 2022:	4,881,300
Mid-term Review (MTR) Date:	7/1/2023
Original Project Completion Date:	4/22/2026
Project Completion Date as reported in FY21:	4/22/2026
Current SAP Completion Date:	4/22/2026

¹ Only for GEF-6 projects, if applicable

Expected Project Completion Date:	4/30/2026
Expected Terminal Evaluation (TE) Date:	4/30/2026
Expected Financial Closure Date:	4/30/2027
UNIDO Project Manager²:	Carmela Centeno

I. Brief description of project and status overview

Project Objective
<p>The objective of the project is to improve the environmental performance of the foam sector in China through the phase-out, introduction of HBCD alternatives and environmentally-sound management of HBCD-containing EPS/XPS foams. The main project components endorsed by the GEF to fulfill the country gaps and contribute to the Global Environment Benefits (GEBs) include (1) strengthening the policy and regulatory framework on the management of HBCD and HBCD-containing EPS/XPS polymer foam products in China (2) promoting technology transfer and investment on the production of HBCD alternatives and application of alternatives to the XPS/EPS foam sector (3) Implementing of environmentally-sound management (ESM) of EPS/XPS foam wastes containing HBCD (4) improving information dissemination, building capacity and establishing knowledge management. The project commits to the achievement of POPs removal/disposal of 54,300 MT for the duration of the project.</p>

Baseline
<p>Hexabromocyclododecane (HBCD) is a persistent organic pollutant which in May 2013 was listed in Annex A of the Stockholm Convention (SC) on Persistent Organic Pollutants (POPs) for its elimination. On 2nd July 2016, the twenty-first meeting of the twelfth session of the Standing Committee of the National People's Congress made the decision on ratifying the amendment to the Stockholm Convention on Persistent Organic Pollutants to list HBCD.</p> <p>HBCD has been put into the global markets since the late 1960s. At that time, it was mainly produced in Europe, Japan and the United States. Around 2000, some enterprises in Shandong and Jiangsu Provinces in China, having access to abundant bromine resources, began to produce HBCD. Since the 1990s, the cumulative production of HBCD in China has reached more than 200,000 metric tons and since 2009, the yearly production exceeded 10,000 t/year.</p> <p>Considering the initiatives undertaken so far and even given the exemptions provided by the Stockholm Convention on the use of HBCD in the EPS and XPS sectors, there are identified gaps for China to comply to the HBCD amendment of the SC. These gaps encompass laws and regulations, product labeling, public awareness, alternative technologies, information on HBCD waste inventory and technologies for HBCD wastes disposal and lacked information collection and sharing. The current project aims to remove the barrier and address the gaps that would allow China to fully address the HBCD issues in the country.</p>

Please refer to the explanatory note at the end of the document and select corresponding ratings for the current reporting period, i.e. FY22. Please also provide a short justification for the selected ratings for FY22.

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. FY21, in the last column.

² Person responsible for report content

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

Overall Ratings ⁴	FY22	FY21
Global Environmental Objectives (GEOs) / Development Objectives (DOs) Rating	<i>Satisfactory (S)</i>	Choose an item.
<p><i>Using the progress rationale reported in section II and III, please briefly justify the selected FY22 risk rating versus the risk ratings reported in FY21.</i></p> <p>No ratings for FY21, as the project had less than one year of implementation.</p>		
Implementation Progress (IP) Rating	<i>Satisfactory (S)</i>	Choose an item.
<p><i>Using the progress rationale reported in section II, please briefly justify the selected FY22 IP ratings versus the IP ratings reported in FY21.</i></p> <p>No ratings for FY21, as the project had less than one year of implementation.</p>		
Overall Risk Rating	<i>Low Risk (L)</i>	Choose an item.
<p><i>Using the progress rationale reported in section II and III, please briefly justify the selected FY22 risk rating versus the risk ratings reported in FY21.</i></p> <p>No ratings for FY21, as the project had less than one year of implementation.</p>		

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

II. Targeted results and progress to-date

Activities	Indicators	Baseline	Target	Progress in FY 22
Component 1: Policy and regulatory framework				
Outcome 1.1: Policy and regulatory framework strengthened on the management and supervision of HBCD and HBCD-containing EPS/XPS polymer foam products in China				
Output 1.1.1: National legislation, regulatory framework and technical specifications to ban the production, usage, import and export of HBCD used in EPS/XPS in China				
Activity 1.1.1.1: Draft national legislation, regulatory framework and technical specifications to ban the production, usage, import and export of HBCD in China.	Number of revised or newly formulated regulations to ban the production, usage, import and export of HBCD in China.	Lack of effective regulations, limits or policies to ban the production, usage, import and export of HBCD in China.	Midterm and terminal: One (1) National announcement on banning HBCD production and usage One (1) updated customs policy on banning the import and export of HBCD; One (1) updated technical policy to eliminate and reduce HBCD and HBCD-containing EPS/XPS	<p>◦ Enacted one (1) national work plan to stress the ban on HBCD production and uses. MEE together with MIIT, MOHORD and SMA has enacted the national HBCD phase-out work plan [EN-Solid2021-237] to reinforce the provincial and municipal authorities' duties to drive the tracking, supervision and further enforcement on all the HBCD enterprises. (June 2021-Mar 2022)</p> <p>◦ Conducted one(1) full scope national inspection-All the provincial authorities of the abovementioned departments has conducted at least one-time joint field enforcement inspection to the enterprises for checking their compliance of the Convention goal of HBCD before Mar 2022. All 19 provinces that once have produced and used HBCD formally notified the central governments that no HBCD production and use be found during the inspection, thanks to the efforts of policy publicity, incentives and encouragement during 2020-2021.</p> <p>◦ Revised and enacted -one(1) policy Added NO HBCD (content of HBCD less than 100 ppm) policy into current Green Procurement Guidelines for Real Estate, which covers 60% real estate developers of the market. (March 2021) This drives the upstream HBCD producers and EPS/XPS producers reduce the production of HBCD products.</p> <p>◦ Notified the SC of the ban on HBCD production and usage. Following the announcement published by the government of China in December 2016 (Announcement No. 84 of 2016), China has notified the Convention that it withdrew the register of specific exemptions of HBCD from Dec 26, 2021.</p> <p>http://chm.pops.int/Implementation/Exemptions/SpecificExemptions/HexabromocyclododecaneRoSE/tabid/5034/Default.aspx</p>
Output 1.1.2: Regulatory policies developed to reduce and eliminate the application of HBCD in EPS/XPS polymer foams, with focus on environmental quality standards and chemical limits of HBCD in EPS/XPS polymer foams and all potential HBCD users				

<p>Activity 1.1.2.1: Draft regulatory environmental quality standards and chemical limits for regulation and supervision of HBCD.</p>	<p>Number of newly formulated or revised regulatory policies on environmental quality standards and chemical limits considering the Basel low POP content and other relevant criteria Availability of a monitoring study with at least 300 testing for HBCD content</p>	<p>Lack of effective regulations or policies on environmental quality standards and chemical limits for HBCD</p>	<p>Midterm and terminal: One (1) set of detection standards of HBCD in EPS/XPS products One (1) report of policy study of HBCD limits in EPS/XPS products and environment One (1) a set of detection methods of HBCD in the environment Draft of limits of HBCD in EPS and XPS products Monitoring study of at least 300 samples for HBCD content and contamination in EPS/XPS products</p>	<ul style="list-style-type: none"> ◦ Enacted (1) set of Industrial Standard for HBCD detection method in the EPS/XPS products has published (2021.4), enabling the supervision of the HBCD content in building product. ◦ Enacted (1) National Standard of HBCD limit in the building insulation products. It has passed the public consultation (2021.9) became effective on Jan 1, 2022. This limit has been recommended to all EPS/XSP enterprises on nation level.
<p>Output 1.1.3: Framework for governmental alternative assessment established and flame retardant alternatives for HBCD and alternative insulation materials for HBCD-containing EPS/XPS foams evaluated</p>				
<p>Activity 1.1.3.1 Development of an evaluation frame and capacity for alternatives assessment on governmental institution level.</p>	<p>Number of government related institution that have the capacity to assess and evaluate alternatives for HBCD and HBCD in EPS/XPS</p>	<p>No specific assessment framework exists in China on governmental level to evaluate alternatives to POPs in current use (e.g. USEPA assessment within the “design for the environment”)</p>	<p>Midterm: One (1) review report on assessment approaches of alternatives in other countries or regions.</p> <p>Terminal: An assessment framework and capacity for the assessment of alternatives is developed in one (1) governmental institution</p>	<ul style="list-style-type: none"> ◦ Determined (1) governmental institution for assessing alternatives of HBCD. The solid waste and chemical center of the MEE is the governmental institution for capacity building for alternatives assessment. They will publish the assessment results in the next reporting period. ◦ Determined the work scope for the baseline analysis of alternative materials to insulation EPS/XPS in China.
<p>Activity 1.1.3.2 Assessment of alternatives to HBCD in the governmental level</p>	<p>Number of alternatives for HBCD evaluated in the governmental level</p>	<p>Lack of official evaluation of alternatives for HBCD. Some information on alternatives Stockholm HBCD in EPS/XPS exist;</p>	<p>Midterm: One (1) review report on available information on alternatives to HBCD and HBCD in EPS/XPS is compiled including a gap analysis of the alternatives</p> <p>Terminal At least 2 alternatives for HBCD evaluated by a governmental related institution for environmental, economic and social impacts.</p>	

Output 1.1.4: National managerial capacity, enforcement, supervision policies, monitoring methods of HBCD and HBCD -containing products strengthened to coordinate and monitor and establish problem-finding mechanism for the polymer foam production sector				
Activity 1.1.4.1 National capacity building in management, enforcement, and supervision of HBCD production and usage	Existence of a formal interministerial group for HBCD management Number of coordination meetings held.	Lack of inter-ministerial cooperation in supervision and enforcement of HBCD elimination. Ministry of Ecology and Environment has piloted supervision visit regarding irregular POPs production activities nationwide	Midterm: Interministerial group of ministries for supervision and enforcement of HBCD elimination established and at least 3 coordination meetings held Terminal: At least 5 coordination meetings held and formal interministerial group for HBCD management established	<ul style="list-style-type: none"> ◦ Came up with HBCD national work plan with 4 focus ministries and conducted one national-level supervision field trip and all provincial governments conducted one local-level supervision field trip. ◦ Consented with State Market Administration on carrying out capacity building activities on the enforcement of HBCD and other intentionally produced POPs
Activity 1.1.4.2 Capacity building of HBCD monitoring in production and usage	No. of trainings conducted on HBCD monitoring Number of institutions capable to conduct the monitoring	Lack of monitoring ability on HBCD and HBCD in EPS/XPS for governmental assessment and enforcement.	Midterm: one (1) institution developed capacity for proper monitoring 1 training sessions conducted Terminal Monitoring capacity of 3 institutions established 3 training sessions conducted	<ul style="list-style-type: none"> ◦ Plan to conduct in the next reporting period.
Activity 1.1.4.3: Build managerial capacity, enforcement, supervision policies and monitoring methods for HBCD in demonstration province	Number of demonstration province (s) which developed and enhanced managerial capacity, enforcement, supervision policies and monitoring methods for HBCD in the life cycle. Number of samples analysed	Lack of capacity for assessing and managing HBCD in local governments	Midterm: 1 to 2 demonstration provinces draft plans for management, detection and supervision of HBCD in production and usage and monitoring initiated. Terminal: 1 to 2 demonstration provinces establish problem-finding mechanism for the HBCD production and polymer foam production and use sector at least 50 samples analysed	<ul style="list-style-type: none"> ◦ Signed the Demonstration Province Agreement with Shandong Province in August 2021. The demonstration province has published a plan for management, detection and supervision of HBCD in production and usage and monitoring. (August 2021), as an output of the Agreement. ◦ Shandong Province published the provincial work plan on HBCD phaseout, conducted 4 times of inspection, 3 times of policy publicity, helped each HBCD producer and user make phaseout plan and will conduct sample analysis(detection) on current products in the next reporting period.
Component 2. Promotion of technology transfer and investment on the production of HBCD alternatives and application of alternatives to the XPS/EPS foam sector				
Outcome 2.1 Total phase out of the production of HBCD in China				
Output 2.1.1: HBCD production lines closed down or converted to HBCD alternatives				

Activity 2.1.1.1 Demonstration of closing down production lines of at least 2 HBCD producers	Number of demonstration plants stopping HBCD production.	Production of HBCD is 18,000 metric tons per year	Midterm and terminal: The 2 HBCD demonstration enterprises no longer produce or sell HBCD.	Finished ◦ All producers (including the 3 demonstration producers supported by GEF, which lead this transformation) have ceased producing HBCD before October, 2021 , dismantled the production lines and properly treated the production waste following the requirements of hazardous waste before November, 2021. ◦ Shandong Province supervised this process with experts and retained the photocopies. The formally reported the result to FECO.
Activity 2.1.1.2: Verify and evaluate the close-down of all HBCD production lines	Amount of HBCD production phase-out and amount and percentage of HBCD stockpile properly stored for disposal (tons)	HBCD is still being produced in the country.	Midterm and Terminal: production of 18000 metric tonnes of HBCD has been stopped. All the remaining HBCD and wastes from HBCD production is stored in an environmentally sound manner	
Activity 2.1.1.3: Demonstration, verification and evaluation of conversion production of HBCD alternatives	Number of HBCD producers converted to productions of alternatives as demonstration and evaluated Amount of HBCD alternatives produced in demonstration plants; Number of BAT/BEP been identified for the individual alternatives Number of samples for HBCD testing carried out	HBCD producers still in production Some HBCD producers have initiatives of producing HBCD alternatives	Midterm and terminal: The 2 demonstration producers have the capacity of producing HBCD alternatives supported by the project At least 2000 metric tons/year of HBCD alternatives produced in demonstration enterprises. 1-2 alternatives of HBCD are evaluated in the production of the 2 demonstration enterprises and BAT/BEP has been identified for the individual alternatives 100 samples for HBCD testing carried out	◦ 2 demonstration enterprises have successfully conducted the production conversion. Shandong Sunris: production capacity of TBBPA-D: 10,000 tons/year Production capacity of brominated SBS polymer:6,500tons/year Shandong Dongxin New material: Production capacity of TBBPA-D: 5000 tons/year ◦ The production lines evaluation has been done in the approved ESMP of the company supported by the project.
Outcome 2.2: Prohibition of HBCD usage in the production of polymer foams or application of other alternatives through the promotion of BAT/BEP				
Output 2.2.1: Demonstration activities on at least 4 types of alternative materials for EPS/XPS foam manufacturing through technology transfer and research implemented				
Activity 2.2.1.1: Select and demonstrate the use of at least 1-2 alternative for HBCD used in 2 EPS in pilot plants	Number of HBCD alternatives adopted in EPS sector; Number of EPS demonstration enterprises supported by the project to adopt	9400 tons/year of HBCD are used in EPS sector Some EPS producers have initiatives to replace HBCD with other flame retardants	Midterm and terminal: At least 2 EPS pilot enterprises use 1-2 HBCD alternative flame retardants supported by the project	◦ Finished the selection of 2 groups of joint companies: Liaoning Litian (EPS beads)+ Ningxia Baoli (EPS Board) Wuxi Xingda (EPS beads)+ Hebei Jiuzhou (EPS board) ◦ Reviewed and approved the ESMP of each company

	the alternatives and evaluated Amount of HBCD avoided by the pilot plants (tons); Number of samples for HBCD testing carried out		At least 800 tonnes/year of HBCD use avoided by 2 EPS demonstration plants 60 samples for HBCD testing carried out	◦ They have finished the production conversion and produced the boards with alternatives (HBCD content less than 100 ppm). They have avoided 2000 tons/year of HBCD use since Oct 2021.
Activity 2.2.1.2 Select and demonstrate at least 1-2 alternatives in 2 pilot enterprises for HBCD used in XPS with research on co-benefits of HCFCs reduction	Number of HBCD alternatives adopted in XPS sector; Number of XPS demonstration enterprises supported by the project to adopt the alternatives and evaluated Amount of HBCD avoided by the pilot plants Number of samples for HBCD testing carried out	6000 metric tons/year of HBCD are used in XPS sector Some XPS producers have initiatives to replace HBCD with other flame retardants	Midterm and terminal: At least 2 XPS enterprises use 1-2 HBCD alternative flame retardants supported by the project 160 metric tons of HBCD avoided by 2 XPS demonstration plants 60 samples for HBCD testing carried out	◦ Finished selection of 3 XPS demonstration enterprises: Beijing Beipeng Beijing Hongqiangxinsheng Guangzhou Fuda ◦ Reviewed and approved the ESMP of each company ◦ They have finished the production conversion and produced the boards with alternatives (HBCD content less than 100 ppm). They have avoided 1500 tons/year of HBCD use since Oct 2021.
Activity 2.2.1.3 : Verify and evaluate the production of alternative insulation materials to EPS/XPS	Number of alternative insulation material to EPS/XPS assessed	No specific environmental, health and social assessment of the production of alternatives to EPS/XPS insulation has been conducted by environmental ministries	Midterm Concept for assessment alternatives to EPS/XPS developed Terminal At least 3 alternative insulation materials to EPS/XPS are assessed	◦ Beijing Beipeng, Beijing Hongqiangxinsheng and Guangzhou Fuda have been assessed and verified by technical support team to the local DEE. ◦ Liaoning Litian (EPS beads)+ Ningxia Baoli (EPS Board) and Wuxi Xingda (EPS beads)+ Hebei Jiuzhou (EPS board) have been assessed by the ESMP team and FECO expert team.
Activity 2.2.1.4: Compile lessons learned and best practice of the substitution of HBCD in EPS and XPS production to educate the other EPS/XPS producers on the switch to alternatives and include the materials for the knowledge platform	Number of case studies on substituting HBCD in EPS and XPS production.	No case study available in China or in the Stockholm Convention BAT/BEP guidance on practical substitution of HBCD in EPS/XPS	Midterm and terminal At least 3 case studies to share lessons learned on best practice of substitution of HBCD in EPS/XPS	◦ Expected to be carried out in the next reporting period.
Output 2.2.2 Replication activities on the best alternatives undertaken in at least 5 companies and outcomes promoted national wide				

Activity 2.2.2.1: Replicate the best alternatives of HBCD to at least 5 companies	Number of companies that produce or use alternatives to HBCD supported by the project. Amount of HBCD production/use avoided by the replication plant. Number of samples tested	Some HBCD producers and EPS/XPS producers have initiatives to produce or use HBCD alternatives	Midterm and end: At least 5 manufacturers start produce and adopt HBCD alternatives/ produce alternative materials 3000 tonnes of HBCD production/use avoided by the replication plant. 170 samples tested	◦ Expected to be carried out in the next or 3rd reporting period.
Output 2.2.3: Promotion of venture capital investment and technology transfer on switching to HBCD -alternatives established .				
Activity 2.2.3.1 Establish public-private partnership or other financial mechanism to support the phase-out of HBCD in EPS/XPS production	Number of financial mechanisms developed to support the phase-out of HBCD in EPS/XPS production national wide	No financial mechanism in EPS/XPS sector to support the change to alternative flame retardants	Midterm: Private sectors engaged in PPP or other financial mechanism established and offered to EPS/XPS and HBCD alternative producers Terminal: PPP mode or other financial mechanisms replicated in EPS/XPS sectors	◦ Expected to be carried out in the next reporting period.
Activity 2.2.3.2 Incentive programs or other promotions to support the replication of the demonstration experiences of substitution of HBCD to other EPS/XPS producers	Number of initiatives supported by the incentive programs or other promotions Total amount of HBCD phased out in EPS and phased out in XPS sector	Productions of EPS/XPS for insulation is currently using HBCD as flame retardant. A few EPS/XPS producers have initiatives to stop using HBCD	Midterm: 1 Plan of incentive programs Draft BAT/BEP guidelines for phase-out of HBCD and promotion of HBCD alternatives Terminal: 9400 metric tons of HBCD phased out in EPS production 6000 metric tons of HBCD in XPS production phased out 1 set of BAT/BEP guidelines for phase-out of HBCD and use of HBCD alternatives	◦ Expected to be carried out in the next or 3rd reporting period.
Component 3. Implementation of environmentally-sound management (ESM) of EPS/XPS foam wastes containing HBCD				
Outcome 3.1: ESM of HBCD-containing EPS/XPS foams implemented				
Output 3.1.1: National inventory and data base on HBCD stocks and waste built and periodically updated				

Activity 3.1.1.1: Establish the inventory and database of HBCD stocks and waste in HBCD production and EPS and XPS sectors.	Presence of the inventory and database of HBCD stocks and waste in HBCD production and EPS and XPS sectors.	No national inventory and database on HBCD stocks and waste. Study from research institution on the stock and initial predicted flow of HBCD available	Midterm: Preliminary HBCD inventory with gap analysis; Guidance of building inventory and database of HBCD stocks and waste in production and EPS/XPS sectors. Terminal: Inventory and database of HBCD stocks and waste in production and EPS/XPS sectors	The raw HBCD is regarded as hazardous waste in China. The local governments reported all manufacturers have properly dealt with the remaining HBCD. All HBCD containing EPS/XPS boards before Dec 25, 2021 can be used, others will be destroyed as solid waste.
Activity 3.1.1.2: Demonstration of establishing inventory and database of in-use HBCD in EPS/XPS building materials in pilot provinces/cities	Number of province/city selected for piloting inventories and database of in-use HBCD containing EPS/XPS in buildings and construction	No identification of the of HBCD containing EPS/XPS in buildings and no related database in China	Midterm: Preparation of the demonstration inventory of HBCD in EPS/XPS in 1 province/city Terminal: Inventory for 1 demonstration province/city established and integrated in a database 1 report of methodology study of establishing the database of in-use HBCD	Determined the work scope and the subcontractor (China Association of Building Energy Efficiency) The implementation plan including the technical methodologies has been approved by a group of experts of 20. The final output is expected to come out in the next reporting period.
Output 3.1.2: Develop HBCD waste identification and management methods on HBCD and HBCD-containing wastes disposal				
Activity 3.1.2.1: Develop identification and regulatory strategy of HBCD containing waste in production and EPS/XPS sectors	Number of draft regulation and identification methodologies for HBCD containing EPS/XPS waste	No specific standard for identification and regulation of HBCD containing waste in China.	Midterm: One (1) set of identification strategy and methodology of HBCD and HBCD containing EPS/XPS waste established Terminal: One (1) draft regulation for management of HBCD containing EPS/XPS waste	The detection method has been developed, as mentioned in Component 1. The raw HBCD is regarded as hazardous waste in China. The local governments reported all manufacturers have properly dealt with the remaining HBCD. All HBCD containing EPS/XPS boards before Dec 25, 2021 can be used, others will be destroyed as solid waste.
Activity 3.1.2.2 Develop identification and management strategy of in-use HBCD in the construction industry and de-commissioning of buildings.	Presence of identification and management strategy and technical specification of in-use HBCD in building industry	No policies or standard for identifying in-use HBCD in EPS/XPS and C&D waste in China	Midterm: 1 set of identification and management strategy of in-use HBCD in construction and industry and de-commissioning of buildings established Terminal: 1 set of technical specification for identification of HBCD	Determined the work scope and the subcontractor (China Association of Building Energy Efficiency) The implementation plan including the technical methodologies has been approved by a group of experts of 20. The final output is expected to come out in the next reporting period.

			containing EPS/XPS in buildings and C&D waste	
Activity 3.1.2.3: Develop technical guidelines for ESM of HBCD containing waste	Number of technical guidelines for ESM of HBCD containing waste	No technical guideline for treating HBCD-containing waste in China	Midterm and terminal: One (1) set of technical guidelines developed for ESM of HBCD containing waste	Determined the work scope and the subcontractor (Chemical and Waste Center of MEE with Shanxi Energy Institute of Tsinghua University) The implementation plan including the technical methodologies has been approved by a group of experts of 10. The final output is expected to come out in the next reporting period.
Activity 3.1.2.4: Compilation of information on screening, classification and separation of HBCD containing waste and management methods for the knowledge management platform	Availability of Information materials online in Chinese and English	No information materials available in Chinese	Midterm: Draft training materials available off-line. Terminal: Information and training materials available on-line	4 technical seminars have been conducted, including 2 international web-seminars that involved the topics of BEP/BEP demonstration of ESM, monitoring and data collection of the HBCD containing in-use boards and de-brominated and EPS/XPS recovery, supported by UNIDO and Bavaria state EPA.
Output 3.1.3 BAT/BEP demonstration of environmentally sound management and disposal of HBCD waste including assessment, comparison and demonstration of different treatment technologies, including volume reduction, HBCD extraction, HBCD decomposition, disposal, circular economy approach for bromine and EPS/XPS recovery				
Activity 3.1.3.1: Assessment and selection of technologies for ESM of HBCD-containing EPS/XPS waste considering circular economy and life cycle	Number of ESM technologies for HBCD-containing waste evaluated and selected	Currently EPS/XPS waste is largely going to landfills and dump sites (Li et al. 2016).	Terminal: At least 4 technologies are evaluated and at least 2 technologies are selected for the pilots	Have selected 3 technologies for HBCD-containing waste treatment and the subcontractors Municipal waste incineration co-treatment (20 tons) (Zhejiang University+Wuhu Oasis Environmental Protection Energy Co. LTD+Hangzhou Kesheng Energy Technology Co. LTD)
Activity 3.1.3.2: Demonstration and implementation at least 2 pilot projects for environmental sound management and disposal of HBCD-containing EPS/XPS waste	Number of pilot project to destroy HBCD or HBCD containing EPS/XPS in an environmentally sound manner Amount of HBCD-containing wastes destroyed/avoided	Currently no destruction project for HBCD containing EPS/XPS in China. Some experiences available in industrial countries.	Midterm: Technical specification for at least 2 pilot projects are developed Terminal: At least 2 pilot projects for ESM of HBCD containing foam are successfully operated and HBCD is destroyed with the required efficiency. At least 100 metric tons of HBCD containing wastes destroyed	Cement kiln co-processing (30 tons) (Beijing General Research Institute of Building Materials Co. LTD+Hangzhou Institute for Advanced Studies, UCAS+Beijing Jinyu Mangrove Environmental Protection Technology Co. LTD+Beijing Jinyu Beishui Environmental Protection Technology Co. LTD) Hazardous waste incineration (20 tons) (SCC+Tianjin Binhai Hejia Veolia Environmental Services Co. LTD) The final output is expected to come out in the next reporting period
Activity 3.1.3.3: Compilation of information and lessons learned on environmental sound management and disposal of HBCD-containing	Number of pilot studies for ESM of HBCD containing EPS/XPS for which information material is compiled	No case study for sound management of EPS/XPS in China or Asia is available.	Midterm and terminal: Information on lessons learned on ESM and disposal of HBCD-containing EPS/XPS waste for the knowledge platform.	<ul style="list-style-type: none"> In the selection of subcontractor for establishing knowledge management platform

EPS/XPS waste for the knowledge management platform		Only short term pilot studies from industrial countries for EPS/XPS destruction is available.		
Component 4. Information dissemination, capacity building and knowledge management				
Outcome 4.1: Improved technical and regulatory capacity on the management of HBCD and HBCD-containing wastes				
Output 4.1.1: Technical trainings for various stakeholders (enterprises, government staff, technicians, researchers etc.) designed and implemented to strengthen capacity on substitution in the HBCD and the EXPS/EPS foam sector, in general.				
Activity 4.1.1.1: Training sessions of management and technical capacity building targeting different stakeholders (government, private sectors, technicians, researchers), as well as targeting females specifically who are in direct contact with hazardous chemicals including HBCD	Number of training materials, Number of trainees disaggregated by gender	No training materials and trainings for the HBCD/alternative BFR production sector, the EPS/XPS production sector or ESM available in Chinese.	Midterm: Two (2) sets of stakeholder training materials, which include gender-specific training information Training session offered once at least. Terminal: 1000 policy makers, technicians, researchers trained; at least 40% of them are female;	Attended/held 4 industrial meetings for HBCD phaseout policies publicity and consultation, influencing over 2000 decision makers in the HBCD related plastic and building industries and HBCD private sectors. °Invited by PINFA China and held a live stream to the industries, which is viewed by 3000 times in June, 2020
Activity 4.1.1.2: Assessment of the social and economic impacts of gender-mainstreaming in foam sector	Presence of such assessment report; Number of audiences reached when disseminating such report	No assessment report in place	Midterm: The assessment report developed, with a special focus on the impacts on female workers – benefits and risks, as well as why it is important to include gender Terminal Dissemination of the report results through trainings, workshops, and online platforms, reaching 1,000 audiences	Work scope is determined, in the selection of the activity subcontractor
Output 4.1.2: Awareness raising activities undertaken for various relevant stakeholders including the general public, NGOs, women and youth sector et c.				
Activity 4.1.2.1 Development of stakeholder specific awareness raising materials and approach for the general public, women, NGOs and the youth sector on HBCD and other POPs in	Number of appropriate awareness raising training materials for informing the general public, women, and the youth on HBCD and other POPs in	No awareness raising materials on HBCD and other POPs in insulation and other construction materials	Midterm: Three (3) sets of awareness raising materials and methodologies: 1. Development of a set of training materials with gender-specific information on how HBCD	Published a brochure with China Plastic Process Industrial Association, which contains information on how HBCD and POPs in general may affect people's health and well-being differently

construction materials and alternatives	construction materials and alternatives		and other POPs may affect human body differently for women, men, and infants; 2. Development of a set of knowledge dissemination materials regarding HBCD and POPs for youth; 3. Development of a set of overall training materials for the general public	
Activity 4.1.2.2: Awareness raising activities for general public, women, NGOs and the youth sector.	Number of persons (male/female) from the general public, , NGOs and the youth informed about the issues of HBCD and POPs, as well as the different impacts they may have on different demographic groups; Ratio of women and youth reached among that number	No awareness raising materials on HBCD in insulation materials	Midterm: 500 citizens, women, NGOs and the youth sector are informed on HBCD and other POPs in buildings; among which 50% should be women and youth. Terminal: 1000 citizens, women, NGOs and the youth sector are informed on HBCD and other POPs in construction; among which 50% should be women and youth.	◦ Expected to be carried out in the next reporting period.
Outcome 4.2: Knowledge management platform set up to contribute to regional/global actions on HBCD management.				
Output 4.2.1: Establishment of a knowledge hub on HBCD and the XPS/EPS foam sector to disseminate lessons learned on a national, regional and global scale				
Activity 4.2.1.1: Knowledge management platform set up to contribute to regional/global actions on HBCD management	Presence of knowledge management platform online with appropriate content	Draft Stockholm and Basel BAT/BEP guidance and guidelines for HBCD are available on BRS website. No webinars or regional trainings conducted.	Midterm: Major content for knowledge platform developed. Alpha version of platform available. Webinar format developed Terminal: Knowledge management platform set up to contribute to regional/global actions on HBCD management.	In the selection of subcontractor for establishing knowledge management platform
Activity 4.2.1.2 Establish partnerships for effective regional and international	Number of partnerships for awareness raising and knowledge communication	Initial contacts were established during PPG phase to the Norwegian project on	Midterm Partners for cooperation for awareness raising are evaluated Terminal	◦4 technical seminars have been conducted, including 2 international web-seminars that involved the topics of BEP/BEP demonstration of ESM, monitoring and data collection of the

awareness raising and knowledge communication		plastic/polymer management in Asia (OPTOCE) and to IHPA which organizes POPs Forums in the EECA region	Co-operations with at least 2 partners are established and common regional awareness activities and knowledge communication implemented	HBCD containing in-use boards and de-brominated and EPS/XPS recovery, supported by UNIDO and Bavaria state EPA.
Activity 4.2.1.3: Reach out and dissemination of lessons learned on HBCD management to national, regional and global stakeholders	Numbers of webinars developed and conducted Numbers of publications in international journals Number of presentations in conferences	Developing and transition economies only start to manage HBCD containing EPS/XPS which will grow the next 30 years. No information on best practice in these countries available.	Midterm: Reach out mechanism and webinar concepts developed; Mechanisms and webinar arrangements designed in a way to maximise female participation; Compilation of training materials, reports and other knowledge products disseminated among platforms, including gender-specific information. Terminal: Information (including advice on gender-mainstreaming the HBD management) distributed in 2 webinars on country, regional and international level. Project outcomes published in at least 2 peer reviewed publications Project outcomes presented in at least 2 Conferences	Delayed due to COVID-19. will elaborate with the establishment of the KM platform
Component 5. Monitoring & Evaluation				
Outcome 5.1 Effective monitoring and evaluation of project impact and sustainability implemented.				
Output 5.1.1: Periodic monitoring and evaluation implemented				
5.1.1.1 Establish Project Coordination Group 5.1.1.2 Establish the National Project Management Team 5.1.1.3 Recruit, a National Technical Advisor (NTA), international expert, policy experts, and technical experts in HBCD alternatives	Availability of a project management office for the project duration. Existence of an operational National Project Management Team for the project duration		<ul style="list-style-type: none"> ➤ Local project management offices established ➤ Training workshops held on contractual management, project management tools ➤ Steering group established with representatives from 	<ul style="list-style-type: none"> • Report on establishment and operation of Steering group • TORs for project management staff • National and international expert recruitment notices and TORs • TORs of the local project management offices

<p>and waste management, evaluation, and program development</p> <p>5.1.1.4 Establish local project management offices in target provinces</p> <p>5.1.1.5 Hold management training classes for national and local project management staff</p>	<p>Existence of an operational project steering group.</p> <p>Number of training workshop and person trained on contractual management and project management tools</p>		<p>national and local stakeholder agencies</p> <p>➤ National Project Management Team established</p>	
<p>Output 5.1.2 An M&E mechanism designed and implemented according to GEF M&E procedures</p>				
<p>5.1.2.1 Hold the Inception Workshop</p> <p>5.1.2.2 Prepare Inception Report</p> <p>5.1.2.3 Measure impact indicators on an annual basis</p> <p>5.1.2.4 Prepare Annual Project Reports and Project Implementation Reviews</p> <p>5.1.2.5 Hold annual Project Coordination Group Meeting</p> <p>5.1.2.6 Carry out mid-term external evaluation</p> <p>5.1.2.7 Carry out final external evaluation</p> <p>5.1.2.8 Complete the Terminal Report</p> <p>5.1.2.9 Carry out annual project financial audits</p> <p>5.1.2.10 Carry out biannual visits to selected field sites</p>	<ul style="list-style-type: none"> • Number of project workshops (inception, evaluation) carried out • Number of project management document developed (project work plan, project report, procurement plan) • Number of non-compliances identified and corrected • Availability of mid term and terminal evaluation reports • Technical and political guidance from the Steering group • Number of recommendations, lesson learned and best practices generated and considered 		<ul style="list-style-type: none"> • Inception Workshop held • Detailed work plans prepared • Data and information against indicators input into the MIS • Non-compliances identified and corrected • Technical and political guidance from the Steering group • Experience summarized and recommendations raised 	<ul style="list-style-type: none"> • Inception workshop meeting minutes • Inception Report • Annual Project Reports and Project Implementation Reviews

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.

Describe in tabular form the risks observed and priority mitigation activities undertaken during the reporting period in line with the project document. Note that risks, risk level and mitigations measures should be consistent with the ones identified in the CEO Endorsement/Approval document. Please also consider the project's ability to adopt the adaptive management approach in remediating any of the risks that had been sub-optimally rated (H, S) in the previous reporting cycle.

	(i) Risks at CEO stage	(i) Risk level FY 21	(i) Risk level FY 22	(i) Mitigation measures	(ii) Progress to-date	New defined risk ⁵
1	Reluctance of companies to undertake a conversion to HBCD alternatives.	/	Low	In the PPG stage, all HBCD producer, EPS and XPS companies and industrial associations are informed of the deadline on the total ban of HBCD production and usage. The producers have been engaged to prepare for the deadline and come up with plan for halt production and production conversion to alternatives. The downstream EPS/XPS enterprises are taking adaptive measures too by trying the alternative FR, which brings a promising domestic market for the producers. MEE and the local authorities will continue to keep communication with the companies to ensure progress in setting up the production lines for alternatives. The prospect of the technical assistance being provided by the project will lessen the risk. The close involvement of responsible ministries advising companies on the benefits of getting involved in conversion activities in light of future regulation will mitigate the risk.	<ul style="list-style-type: none"> ✓ All HBCD producers have ceased the production of HBCD. To keep the business in order, they all seek to produce alternatives to HBCD or other products. ✓ The down-streaming EPS/XPS enterprises are using alternative FR, which brings a promising domestic market for the producers. ✓ MEE and the local authorities have continued to keep communication with the companies to ensure progress in setting up the production lines for alternatives. The prospect of the technical assistance being provided by the project will lessen the risk. ✓ The close involvement of responsible ministries advising companies on the benefits of participating in conversion activities in light of future regulation to control the risk. 	<input type="checkbox"/>
2	Lack of ideal and economical alternatives to HBCD in the production of EPS and XPS.	/	Low	The project will encourage EPS and XPS enterprises to develop substitutes of HBCD during the exemption period and introduce international advanced alternative technologies. The project will organize functionality tests in order to select technically qualified alternatives that will meet the quality requirements for concerned uses. Financial incentives will be awarded to those who successfully	<ul style="list-style-type: none"> ✓ The price of alternatives and the operational cost of using the alternative are stable from 2022, 10-20% higher than the price of HBCD. ✓ Financial incentives are in place and have been awarded to those who have successfully phase in alternatives to cover part of the incremental costs associated with the R&D, production, and distribution 	<input type="checkbox"/>

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

				phase in alternatives to cover part of the incremental costs associated with the R&D, production, and distribution.		
3	Alternatives to HBCD and EPS/XPS using alternative FR not up to the required technical standards	/	Low	Most companies have long experience in producing brominated FR. Also, China has standards for flammability and appropriate testing methodologies are known. Therefore, this risk seems rather low.	The responsible departments are testing the technical qualities of the alternative products. The project is supporting the modification of current standards that will ensure smooth transition to HBCD alternatives.	<input type="checkbox"/>
4	Delay / difficulties in demonstration of the environmental sound management (ESM) of HBCD and HBCD waste	/	Medium	The major activities for the waste management is scheduled in years 3, 4 and 5 of the project. However, assessment activities on the ESM of waste including lessons learned in other countries and selection and planning activities of technologies will be undertaken from the project onset.	Lessons learned in other countries and selection and planning activities of technologies are undertaken in this reporting period.	<input type="checkbox"/>
5	Impact of climate change	/	Medium	A major risk related to climate change is flooding of production areas. An assessment during the PPG showed that 90% of the participating companies are located in the northern part of the Yangtze River where the weather is generally dry with low associated flooding occurrences. The local sudden destructive extreme climate rarely occurs, including relatively common climate disasters, drought and flood. Both disasters have early warning and mediation measures, which will not affect the project. The mitigation measures include strengthening the daily drill, organizing the disaster prevention and anti-disaster training, following the arrangement and deployment of the local disaster prevention headquarters, evacuating the personnel in time and ensuring the property safety as much as possible.	The meteorological and emergency management authorities are strengthening the daily drill, organizing the disaster prevention and anti-disaster training, following the arrangement and deployment of the local disaster prevention headquarters, evacuating the personnel in time and ensuring the property safety as much as possible.	<input type="checkbox"/>
6	Current pandemic, particularly COVID-19, can impact industrial production and the larger economy as experienced in recent months		Medium	Chinese central government has taken effective measures against the Coronavirus (COVID-19) as acknowledged by the WHO and carry out financial rescue plan for the private enterprises especially small businesses heavily affected by the virus. Furthermore, industrial production has already re-started in the country and the local	China's economy is recovering slowly back to the pre-covid 19 situation. Industrial production has already re-started in the country to mitigate economic losses. Industries and enterprises have to follow the guidelines on precaution, quarantine and medical treatment.	

				governments have issues guidelines on precautions, quarantine and medical treatments to protect the enterprises from economic losses in the global pandemic. Lessons learned from the management of other concerns of this nature will be useful.		
7	Socio-economic risks, including manufacturers losing competitiveness on national and international market due to the cost of alternatives, reduced job and risk of closure of factories	/	Medium	Since, the production of HBCD will be phased out, the demands from EPS/XPS consumers will bring the market for alternative FRs. Almost all HBCD producers in China have conversion plans and therefore, job losses and closure of factories are not imminent.	the production capacity of alternatives to HBCD are rising, the demands from EPS/XPS consumers have brought the market for alternative FRs	

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.

N/A for this reporting period

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

While the workplan has to be amended to mitigate the impact of the COVID-19 pandemic, it did not significantly influence the progress to the project development objectives (PDO). The production and use of HBCD has been phased out since December 12, 2021 reflecting the high commitment of China to implement the Convention goal. China's economy is recovering slowly back to the pre-COVID 19 situation. Industrial production has already restarted in the country to mitigate economic losses. Industries and enterprises have to follow the guidelines on precaution, quarantine and medical treatment.

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

N/A for this reporting period

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

N/A for this reporting period

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	The working environment pose a potential threat to technical staff (e.g. gas leakage, PCB oil spillage, electric shocks, etc.)?	Put strict terms regarding the personal protection to the technical staff during the procurement process; Field visit to the enterprises; carry out training sessions Require all enterprises supported by the GEF submit Environmental and Social Safeguard Plan (including the due diligence report of ES) and emphasize the requirement on personal protection.	Require all enterprises conduct Environment and Social Safeguard Monitoring every half year by the 3 rd party company and the the report is part of payment condition. The local authorities take quarterly routine inspection to the enterprises.
	The project, either through a direct execution and/or a contractual arrangement: (i) generate or cause generation of solid, liquid or gaseous waste/emissions; (ii) use, cause use of, or manage the use, storage or disposal of hazardous materials and chemicals, including pesticides; (iii) significantly consume or cause consumption of water (>5,000 m ³ /day), energy, or other resources?	The project has required and supported the enterprises stop generating HBCD and HBCD containing waste. Require all enterprises supported by the GEF submit Environmental and Social Safeguards Assessment Require all enterprises be supervised by local environmental authorities and/or third-party monitoring companies on the hazardous materials and chemical	The phaseout of HBCD has been verified by local authorities Require all enterprises conduct Environment and Social Safeguard Monitoring every half year by the 3 rd party company and the report is part of payment condition. The local authorities take quarterly routine inspection to the enterprises.

	The project pose risks and have potential negative impacts to the health, safety and security of the project-affected communities during its lifetime?	All enterprises selected are in the industrial part which is 10 km away from citizens Notify the communities and publicize the policies	Carry out survey to identify the contaminated sites with precautionary principles
(ii) New risks identified during project implementation (if not applicable, please insert 'NA' in each box)	NA	NA	NA

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 project have successfully engaged, in various degrees, the identified stakeholders in the implementation of the envisaged activities and has their full support and commitment.

The project has continue its collaboration with the Bavaria Environment Agency (LfU Bayerisches Landesamt für Umwelt) with 6 regular meetings and 2 international workshops on HBCD-related topics.

Various governmental entities were also consulted/engaged on various topics, including the following:

- Department of Solid Waste and Chemicals (DSWC). On the conduct of Several public consultations on HBCD policies
- Department of International Cooperation on the holding of the project Inception Workshop
- Department of Laws, Regulations, and Standards on the HBCD national workplan
- Department of Ecological and Environmental Monitoring on integrating the industrial POPs, including HBCD, to the monitoring of conventional pollutants,
- Ministry of Housing and Urban Rural Development on the banning of HBCD (including its publication).
- State Administration of Market Supervision on 4 inter-ministerial consultations on the HBCD ban and publication of the HBCD ban and the national workplan on HBCD
- Ministry of Industry and Information Technology on 2 inter-ministerial consultations on the HBCD ban and publication of the HBCD ban and the national workplan on HBCD

The project has also actively engaged the Department of Ecology and Environment of Shandong Province with an agreement signed with FECO/MEE and SDDEE and conduct of a workshop involving 200 municipal officials and decision-makers of HBCD enterprises and holding of 5 coordination meetings

Industrial enterprises and HBCD producers/users have participated in various consultative meetings and workshops on relevant activities including the close down, production conversion and demonstration activities.

Several civil society organizations, the academe and public organizations have participated in various consultations and workshops as relevant to their mandate and function.

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

The HBCD producers think very highly of UNIDO and FECO for providing timely help that ensured them a smooth technical transition to the greener industrial production. (email received)
 China Plastic Processing Industrial Association and China Flame Retardant Society thanked, in an interview, the GEF, UNIDO and FECO for bringing the development of alternative technology that accelerate the phase-out of hazardous chemicals

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

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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),.

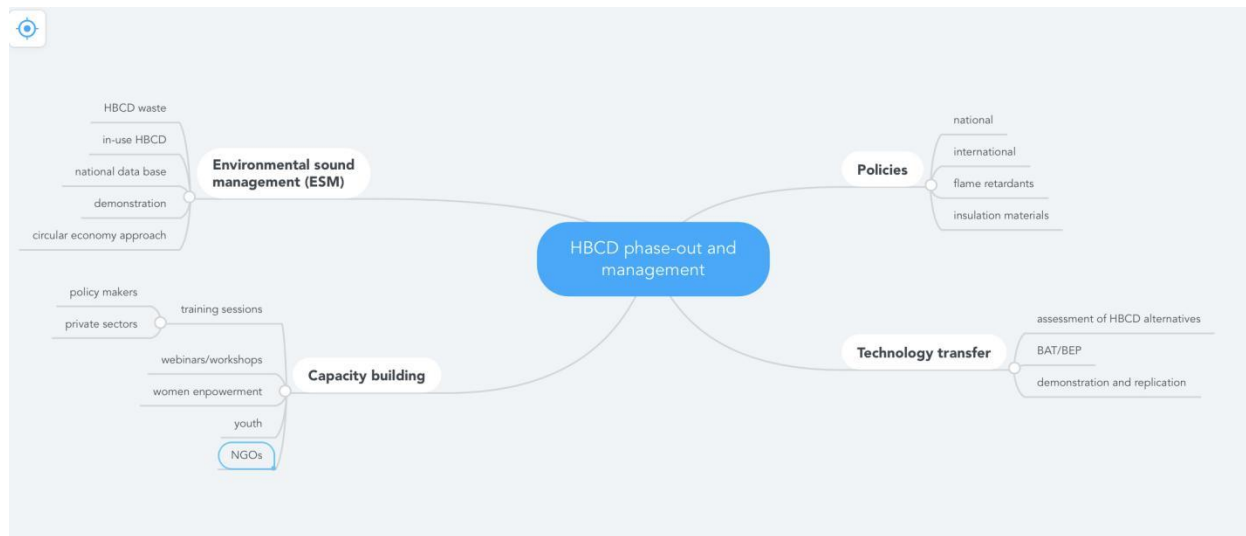
Baseline		Outcome Results	Activities that contribute to the results
Item Description	Content	Content	
Representations of female employees in the companies in general (i.e. the ratio of women among the total workforce)	37%	41% and above as an average across companies and 33% in every company	Set the enterprises that have female managers or 40% female employees as prioritized condition in the selection of demonstration enterprises
Gender awareness of the managers of the companies Low: not willing to hire females when compared with male candidates with similar backgrounds; Medium: recognizing the advantages of having females as both employees and decision makers; High: recognizing the necessity of ensuring gender parity in workplace, setting up schemes to actively promote such gender parity	Low in some, medium in others	Medium - High	publicized female engagement in the private sector as a separate section in the public workshops
Health awareness of female workers in the biohazards of POPs (HBCD in this case) Low: not familiar with females'	Low: Female workers vaguely	Medium - High	Explained how HBCD would potentially harm female health, equally to male workers how they

vulnerabilities when exposed to POPs; Medium: harms of POPs on reproduction health understood; High: actively seek protective measures against exposure	understood the hazards and female vulnerability (e.g. would transfer from production line roles to office and administrative roles after getting married (planning for pregnancy), but have limited understandings of its biohazards otherwise.		will be influenced Prepare to carry out gender-mainstreaming training sessions
Representations of female decision-makers in companies (i.e. ratio of female decision-makers among the total number of managerial positions)	33%	38% and above as an average, and 29% in each company	Set the enterprises that have female managers or 40% female employees as prioritized condition in the selection of demonstration enterprises
Scheme of ensuring the female to male ratio in the shortlist of candidates to be selected as 1) workshop managers, 2) middle to senior level leaders	None across all companies	Yes	
Whether an women's representative or a women's association is in place in the companies	Yes in 2 companies; None in the rest	Yes	
Whether organizations working with women to share their domestic tasks (help with care taking) and to promote their physical and psychological well-being are in place	Yes in some companies (e.g. xurui has summer and winter camps for female employees' children during the school breaks)	Yes	

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.

In preparation to establish the KM platform



The center of the knowledge map is HBCD phase-out and management in China, which is the key goal of the project. To achieve this, the first knowledge category is the policies developed in the component 1. These include national and international policies on flame retardants, insulating materials, circular economy and alternative assessment. The second knowledge category is the technology transfer developed in the Components 2 and 3. Under technology transfer, there are three subcategories: a assessment of HBCD alternatives, BAT/BEP, demonstration and replication, in which BAT/BEP is proposed for HBCD production, EPS/XPS production and waste management. The third knowledge category is the Environmental Sound Management (ESM) developed under Component 3. HBCD waste, in-use HBCD inventory, industries, demonstration, circular economy approach are all included in this category. For ESM in the industries, EPS, XPS, polymer and plastics are classified as subcategories.

During this reporting period, several partners participate in a series of activities, which constitute the fourth category of knowledge map. These activities include training sessions, webinars, conferences and workshops, while the partners policy makers, business owners, researchers and scientists. For this reporting period, the following were held:

- 4 industrial meetings for HBCD phaseout policies publicity and consultation, influencing over 2000 decision makers in the HBCD related plastic and building industries and HBCD private sectors.
- 1 workshop held for plan implementation, involving 200 municipal-level governmental officials and local enterprise owners in Shandong in August 2021.
- 4 technical seminars, including 2 international web-seminars that involved the topics of a assessment of HBCD alternatives, BEP/BEP demonstration of ESM, monitoring and data collection of the HBCD containing in-use boards and de-brominated and EPS/XPS recovery, supported by UNIDO and Bavaria state EPA.

The last category of the knowledge map is the contributions and impacts of the project which will be shared through the clearing house of the SC Secretariat and the BCRC-SCRC China, among other channels. Through the implementation of the project, the production, usage, export and import of HBCD will be banned by December 2021, and HBCD alternatives will be used in the EPS / XPS sectors delivering significant contributions and impacts on the environment, economy and the society, as a whole at the national, regional and even global levels.

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

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.

The project has achieved significant GEB during the 1st reporting period, compared to the initial baseline. The PDO of GEBs (18000tonnes/year of HBCD phased out) have been reached without flaw. With consistent capacity building efforts on supervision and enforcement of related policies, the possible illegal HBCD production and use will be controlled. The project has successfully implemented the strategies on the management of current existent and the future HBCD containing waste.

Challenges lie in the gender activities and knowledge management components which is impacted by the lack of national priority on gender policies and government’s censorship of public information to the foreign audience.

2. Please briefly elaborate on any minor amendments⁶ 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	N/A
<input type="checkbox"/>	Components and Cost	N/A
<input type="checkbox"/>	Institutional and Implementation Arrangements	N/A
<input type="checkbox"/>	Financial Management	N/A
<input type="checkbox"/>	Implementation Schedule	N/A
<input type="checkbox"/>	Executing Entity	N/A
<input type="checkbox"/>	Executing Entity Category	N/A
<input type="checkbox"/>	Minor Project Objective Change	N/A
<input type="checkbox"/>	Safeguards	N/A
<input type="checkbox"/>	Risk Analysis	N/A
<input type="checkbox"/>	Increase of GEF Project Financing Up to 5%	N/A
<input type="checkbox"/>	Co-Financing	N/A
<input type="checkbox"/>	Location of Project Activities	Changes in the participating industrial enterprises
<input type="checkbox"/>	Others	

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

From the project delivery report, a total obligation and disbursement of USD 4, 881, 300 is reflected. As this is a FECO-executed project, disbursement is based on achievement of outputs but obligations are created based on the project document. For the disbursed funds to FECO, financial implementation is on track for this 1st reporting period. Though the delivery rate is relatively low, because most of the subcontracts last for at least 12 months and some are at the initial stage, the contract value shows the financial projections have been duly implemented as per the original

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%.

plan- with full achievement of the PDO indicator on POPs.

Disbursement: 5,219,356.73 yuan RMB(around 802,977 USD), 6.42%

Contract Value: 37,483,132.6 yuan RMB (around 5,766,635 USD), 46.17%

Co-financing obtained: 81,250,000 USD (against 100,140,000 USD ad per CEO endorsement)

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.

COMPONENT, Outcome, Output	Expenditures at Year 1	Year 2				Year 3				Year 4				Year 5				Total
		quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
Component 1: Policy and regulatory framework																		
Outcome 1.1: Policy and regulatory framework strengthened on the management and supervision of																		
HBCD and HBCD-containing EPS/XPS polymer foam products in China																		
<i>Output 1.1.1: National legislation, regulatory framework and technical specifications to ban the production, usage, import and export of HBCD used in EPS/XPS in China</i>	38000	12500	15000	21500	10000	10500	16500	7500	0	17500	0	0	0	0	0	0	0	149000
<i>Output 1.1.2: Regulatory policies with focus on environmental quality standards and chemical limits</i>	13796	19000	20704	15000	25000	25000	12000	0	0	10000	7000	0	0	0	0	0	0	147500
<i>Output 1.1.3: Frame for governmental alternative assessment established and flame retardant</i>	0	27300	26150	25000	26150	16700	15000	5000	0	12200	5000	0	0	0	0	0	0	158500

<i>alternatives for HBCD and alternative insulation materials for HBCD-containing EPS/XPS foams evaluated</i>																			
<i>Output 1.1.4: National managerial capacity, enforcement, supervision policies, monitoring methods of HBCD and HBCD-containing products strengthened to coordinate and monitor and establish problem-finding mechanism for the polymer foam production sector</i>	119103	23000	256000	0	158000	0	0	125600	99697	0	0	13600	10000	0	0	0	0	0	805000
Subtotal for Component 1	170899	81800	317854	61500	219150	52200	43500	138100	99697	39700	12000	13600	10000	0	0	0	0	0	1260000
Component 2: Promotion of technology transfer and investment on the production of HBCD alternatives and application of alternatives to the XPS/EPS foam sector																			
Outcome 2.1: Total phase out of the production of HBCD in China																			
<i>Output 2.1.1: Production lines closed down or converted to HBCD alternatives</i>	238060	1488940	256000	357600	359400	0	0	0	0	0	0	0	0	0	0	0	0	0	2700000

Outcome 2.2: Prohibition of HBCD usage in the production of polymer foams or application of other alternatives through the promotion of BAT/BEP

<i>Output 2.2.1: Demonstration activities on at least 4 types of alternative materials for EPS/XPS foam manufacturing through technology transfer and research implemented</i>	319535	380465	250000	450000	100000	0	0	0	0	0	0	0	0	0	0	0	0	1500000
<i>Output 2.2.2 Replication activities on the best alternatives undertaken in at least 5 companies and outcomes promoted national wide</i>	0	101000	0	275000	125000	328000	0	0	0	27000 0	0	0	0	0	0	0	0	1099000
<i>Output 2.2.3: Promotion of venture capital investment and technology transfer on switching to HBCD-alternatives established .</i>	0	0	165000	25000	127300	98000	75000	92000	85000	30700	12500 0	0	0	13800 0	25000	45000	0	961000
Subtotal for Component 2	557595	197040 5	671000	1107600	711700	426000	75000	92000	85000	30070 0	12500 0	0	0	13800 0	25000	45000	0	6330000

Component 3: Implementation of environmentally-sound management (ESM) of EPS/XPS foam wastes containing HBCD

Outcome 3.1: ESM of HBCD-containing EPS/XPS foams implemented

<i>Output 3.1.1: Build and</i>	0	15000	15000	21000	21000	27500	27500	28000	28000	20000	20000	23500	23500	15000	15000	25000	25000	285000
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<i>periodically update National inventory and data base on HBCD stocks and waste</i>																			
<i>Output 3.1.2: Develop HBCD waste identification and management methods on HBCD and HBCD-containing wastes disposal</i>	27500	5000	9500	5000	0	26000	10000	0	0	15000	5500	15000	0	15000	9500	7000	0	133500	
<i>Output 3.1.3 BAT/BEP demonstration of environmentally sound management and disposal of HBCD waste including assessment, comparison and demonstration of different treatment technologies, including volume reduction, HBCD extraction, HBCD decomposition, disposal, circular economy approach for bromine and</i>	0	55000	135000	95800	46200	400000	465000	12500 0	46000	50850 0	67500	85000	43500 0	20000 0	26520 0	50800	0	2664000	

EPS/XPS recovery																			
Subtotal for Component 3	27500	75000	159500	121800	67200	453500	502500	153000	74000	543500	93000	123500	458500	230000	289700	82800	25000	3480000	
Component 4: Information dissemination, capacity building and knowledge management																			
Outcome 4.1 Improved technical and regulatory capacity on the management of HBCD and HBCD-containing wastes																			
Output 4.1.1: Technical trainings for various stakeholders (enterprises, government staff, technicians, researchers etc.) designed and implemented to strengthen capacity on HBCD and the EXPS/EPS foam sector, in general	23800	0	0	24109.5	12500	0	0	25000	24990.5	0	0	17400	17400	0	0	17400	17400	162600	
Output 4.1.2: Awareness raising activities undertaken for various relevant stakeholders including the general public, NGOs,	0	25000	15000	0	0	25000	15000	0	0	25000	15000	0	0	20000	10000	0	0	140000	

women and youth sector etc.																		
<i>Outcome 4.2: Knowledge management platform set up to contribute to regional/global actions on HBCD management.</i>																		
<i>Output 4.2.1: Establishment of a knowledge hub on HBCD and the XPS/EPS foam sector to disseminate lessons learned on a national, regional and global scale</i>	0	0	25000	25000	25000	17500	20000	20000	17500	17500	20000	20000	17500	17500	20000	20000	17500	242500
Subtotal for Component 4	23800	25000	40000	49109.5	37500	67500	59990.5	20000	17500	59900	52400	20000	17500	37500	30000	37400	34900	630000
Component 5: Monitoring & Evaluation																		
<i>Outcome 5.1 Effective monitoring and evaluation of project impact and sustainability implemented</i>																		
<i>Output 5.1: Periodic monitoring and evaluation implemented</i>	730	0	0	15035	15035	0	0	19500	19500	0	0	10200	10200	0	0	14900	14900	90200
<i>Output 5.1.2 Midterm and terminal evaluation report conducted</i>	10800	0	5400	0	5400	0	33400	0	33400	0	5400	0	5400	0	40400	0	40400	99200
Subtotal for Component 5	11530	0	5400	15035	20435	0	33400	19500	52900	0	5400	10200	15600	0	40400	14900	55300	189400
Project total	791324	2152205	1193754	1355044.5	1055985	999200	714390.5	422600	329097	943800	287800	167300	501600	405500	385100	180100	115200	12000000
<i>Project Management cost</i>	60000	45000	45000	45000	45000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	600000

Project total including PM	851324	219720 5	123875 4	1400044. 5	110098 5	102920 0	744390. 5	45260 0	35909 7	97380 0	31780 0	19730 0	53160 0	43550 0	41510 0	21010 0	14520 0	1260000 0
Total by year	6.76%	47.12%				20.52%				16.04%				9.57%			100.00%	

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

X. Synergies

1. Synergies achieved:

The effect of 19 completed and ongoing projects in the focal areas of POPs and Chemicals and Waste funded by GEF in China lays a good foundation for the successful inception of the project. The outputs and results from these projects provided an integral framework of the proposed project regarding capacity building, regulatory guarantee and technical support.

- The development of the original NIP and updated NIP provides a good institutional capacity for the preparation and implementation of the proposed project with support of the UNIDO-GEF project "Building the Capacity of the People's Republic of China to Implement the Stockholm Convention on POPs and Develop a National Implementation Plan" (GEF ID 1412) and the UNIDO-GEF project "China's Compliance with the Stockholm Convention" (GEF ID 5624). In particular, the updated NIP has also developed a preliminary inventory of HBCD in China and identified prioritized action plans to reduce and eliminate the production and usage of HBCD, which are fully coordinated in the proposed project. In addition, since HBCD and PFOS are both new POPs with special exemptions that where they are still produced in China, experiences on World Bank-GEF Reduction and Phase-out of PFOS in Priority Sectors (GEF Project ID 9269) could be referred in the industrial chemical regulatory management mechanism of HBCD.
- The completed and ongoing project funded by GEF provided technical support for the implementation of the proposed project. For instance, the technology transfer center, which was established by the UNIDO/GEF projects "Strengthening institutions, regulations and enforcement capacities for effective and efficient implementation of the National Implementation Plan (NIP) in China" (GEF ID 3263), will continuously provide service for identifying and evaluating alternatives of HBCD in XPS and EPS sector. The cement co-processing technology, which was successfully demonstrated and validated in the UNIDO/GEF "Environmentally Sound Management and Disposal of Obsolete POPs Pesticides and Other POPs Wastes" (GEF ID 2926), will be used as a potential technology for HBCD containing waste disposal. The incineration technology and facilities built by the World Bank project "PCB Management and Disposal Demonstration" (GEF ID 2360) can be another option for the disposal of HBCD containing waste in the proposed project.

Coordination has been established with other initiatives during the inception phase, as those related to the XPS sector under the framework of the Montreal Protocol for the Protection of the Ozone Layer. Meanwhile, an initiative funded by Bavarian State Ministry, Germany is coordinated with the establishment of a knowledge hub on HBCD and the XPS/EPS foam sector to disseminate lessons learned on a national, regional and global scale. 2 workshops have been held in the inception phase.

Coordination with the Turkey HBCD project (GEF ID 10082) will be ensured. As the two projects share a common objective, knowledge exchange and sharing will ensure best use of resources and experiences. Coordination will also be established with other initiatives, as those related to the XPS sector under the framework of the Montreal Protocol for the Protection of the Ozone Layer. Meanwhile, an initiative funded by Bavarian State Ministry, Germany is coordinated with the output 4.3 of the project to establishment of a knowledge hub on HBCD and the XPS/EPS foam sector to disseminate lessons learned on a national, regional and global scale. The knowledge and experience gained from the Turkey HBCD and the current project will contribute greatly to these knowledge hub.

3. Stories to be shared (Optional)

Please provide a brief summary of any especially interesting and impactful project results that are worth sharing with a larger audience, and/or investing communications time in. Please include links to any stories/videos available online.

EXPLANATORY NOTE

1. **Timing & duration:** Each report covers a twelve-month period, i.e. 1 July 2021 – 30 June 2022.
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 is <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.