



## **Enhancing environmental performance in the expanded and extruded polystyrene foam industries in Turkey**

### **Part I: Project Information**

#### **GEF ID**

10082

#### **Project Type**

FSP

#### **Type of Trust Fund**

GET

#### **CBIT/NGI**

CBIT

NGI

#### **Project Title**

Enhancing environmental performance in the expanded and extruded polystyrene foam industries in Turkey

#### **Countries**

Turkey

#### **Agency(ies)**

UNIDO

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

Ministry of Environment and Urbanization

#### **Executing Partner Type**

Government

#### **GEF Focal Area**

Chemicals and Waste

#### **Taxonomy**

Focal Areas, Chemicals and Waste, Green Chemistry, Disposal, Persistent Organic Pollutants, New Persistent Organic Pollutants, Best Available Technology / Best Environmental Practices, Stakeholders, Beneficiaries, Private Sector, Individuals/Entrepreneurs, Gender Equality, Gender Mainstreaming, Capacity, Knowledge and Research, Innovation, Capacity Development, Knowledge Generation, Knowledge Exchange

**Rio Markers**

**Climate Change Mitigation**

Climate Change Mitigation 0

**Climate Change Adaptation**

Climate Change Adaptation 0

**Submission Date**

6/30/2020

**Expected Implementation Start**

4/1/2021

**Expected Completion Date**

3/31/2024

**Duration**

36In Months

**Agency Fee(\$)**

303,525.00

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

<b>Objectives/Programs</b>	<b>Focal Area Outcomes</b>	<b>Trust Fund</b>	<b>GEF Amount(\$)</b>	<b>Co-Fin Amount(\$)</b>
CW-1-1	Phaseout, elimination and avoidance of HBCD, a chemical of global concern and its waste in the environment and in processes, materials and products, namely EPS/XPS insulating foam consistent with country obligations under the Stockholm Convention	GET	3,195,000.00	26,259,954.00
<b>Total Project Cost(\$)</b>			<b>3,195,000.00</b>	<b>26,259,954.00</b>

## B. Project description summary

### Project Objective

To promote the replacement of persistent organic pollutants with environmentally sound alternatives in the EPS and XPS foam industries in Turkey

<b>Project Component</b>	<b>Financing Type</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Trust Fund</b>	<b>GEF Project Financing(\$)</b>	<b>Confirmed Co-Financing(\$)</b>
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Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 1: Regulatory strengthening, capacity building, stakeholder awareness and verification of environmentally sound alternatives for the replacement of HBCD	Technical Assistance	<p>Outcome 1.1. Up to date non-proprietary information respecting HBCD alternatives and facilitated access to them provided and broad stakeholder awareness on the issue communicated.</p> <p>Outcome 1.2. Regulatory capacity support for control and enforcement to sustained HBCD phase out delivered.</p> <p>Outcome 1.3. Measures for the control and environmental ly sound management of HBCD containing waste implemented.</p>	<p>Output 1.1.1. International references and expert contacts documented for dissemination to industrial stakeholders in the EPS and XPS sectors.</p> <p>Output 1.1.2. Workshops and information dissemination on alternatives and access to them featuring international and national experts organized and delivered to a broad range of industrial, institutional and NGO stakeholders impacted by HBCD phaseout.</p> <p>Output 1.2.1. Gaps in regulatory control measures addressed in support of sustained elimination of HBCD use and import implemented including strengthening of customs controls on HBCD imports consistent</p>	GET	350,000.00	10,404,899.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 2. Elimination of HBCD use in the EPS sector in Turkey	Technical Assistance	<p>Outcome 2.1. Pre-blended polystyrene (PS) producers have required technical information and capability to complete selection and production of alternative flame retardant containing production.</p> <p>Outcome 2.2. National EPS association (EPSDER) is technically supported in its programming to provide collective information and supporting laboratory capability for members on the use of alternative flame retardant in all stages of EPS production.</p>	<p>Output 2.1.1. Individual pre-blended PS producers receive needed technical support on an individual proprietary basis to make optimum competitive decisions on alternative selection, finalize required investment to complete phase out and support producers of final EPS products in the production of HBCD free product.</p> <p>Output 2.2.1. Technical information dissemination on alternatives for the ESP sector is delivered through EPSDER through support of provision of technical references in Turkish and sponsorship of workshop events utilizing recognized international and national experts.</p> <p>Output 2.2.2.</p>	GET	250,000.00	206,200.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 2. Elimination of HBCD use in the EPS sector in Turkey	Investment	Outcome 2.3. Complete phase out of HBCD use in domestic production of pre-blended polystyrene production (975 t HBCD/year) used in the EPS sector directed to national markets is achieved.	Output 2.3.1. Phase out of HBCD based production and replacement with suitable alternatives completed such that baseline HBCD consumption of 975 t/year is eliminated.	GET	1,535,000.00	11,088,441.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 3. Elimination of HBCD use in the XPS sector in Turkey	Technical Assistance	Outcome 3.1. XPS producers have required technical information and capability to complete selection and production of alternative flame retardant containing production.	Output 3.1.1. Individual XPS producers receive needed technical support on an individual proprietary basis to make optimum competitive decisions on alternative selection and finalize required investment to complete phase out.	GET	200,000.00	160,000.00
		Outcome 3.2. National XPS association (ISODER) is technically supported in its programming to provide collective information for members on the use of alternative flame retardant in all stages of XPS.	Output 3.2.1. Technical information dissemination on alternatives for the XPS sector is delivered through ISODER through support of provision of technical reference in Turkish and sponsorship of workshop events utilizing recognized international and national experts.			



Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 3. Elimination of HBCD use in the XPS sector in Turkey	Investment	Outcome 3.3. Complete phase out of HBCD use in domestic production of XPS production (705 t HBCD/year) used in the XPS sector is achieved.	Output 3.3.1. Phase out of HBCD based production and replacement with suitable alternatives completed such that baseline HBCD consumption of 705 t/year is eliminated.	GET	565,000.00	3,220,414.00
Component 4. Monitoring and Evaluation	Technical Assistance	Outcome 4.1. Outcomes from project activities assessed and lessons learnt disseminated for sustainable replication.	Output 4.1.1. Project impact indicators designed, applied and project mid-term review and terminal evaluation conducted.	GET	150,000.00	580,000.00
<b>Sub Total (\$)</b>					<b>3,050,000.00</b>	<b>25,659,954.00</b>
<b>Project Management Cost (PMC)</b>						
			GET	145,000.00	600,000.00	
			<b>Sub Total(\$)</b>	<b>145,000.00</b>	<b>600,000.00</b>	
<b>Total Project Cost(\$)</b>				<b>3,195,000.00</b>	<b>26,259,954.00</b>	

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

<b>Sources of Co-financing</b>	<b>Name of Co-financier</b>	<b>Type of Co-financing</b>	<b>Investment Mobilized</b>	<b>Amount(\$)</b>
Recipient Country Government	Ministry of Industry and Technology of Turkey (MoIT)	In-kind	Recurrent expenditures	2,104,419.00
Recipient Country Government	Turkish Standards Institute (TSE)	In-kind	Recurrent expenditures	1,049,800.00
GEF Agency	UNIDO	Grant	Investment mobilized	80,000.00
GEF Agency	UNIDO	In-kind	Recurrent expenditures	100,000.00
Private Sector	Industry Association - EPSDER	Equity	Investment mobilized	66,200.00
Private Sector	Industry Association - EPSDER	In-kind	Recurrent expenditures	100,000.00
Private Sector	Industry Association - IZODER	In-kind	Recurrent expenditures	100,000.00
Private Sector	Aschem	Equity	Investment mobilized	863,626.00
Private Sector	Aschem	In-kind	Recurrent expenditures	10,000.00
Private Sector	BTM	Equity	Investment mobilized	2,554,947.00
Private Sector	BTM	In-kind	Recurrent expenditures	10,000.00
Private Sector	CFN	Equity	Investment mobilized	3,708,500.00
Private Sector	CFN	In-kind	Recurrent expenditures	10,000.00

<b>Sources of Co-financing</b>	<b>Name of Co-financier</b>	<b>Type of Co-financing</b>	<b>Investment Mobilized</b>	<b>Amount(\$)</b>
Private Sector	Dinamik	Equity	Investment mobilized	140,960.00
Private Sector	Dinamik	In-kind	Recurrent expenditures	10,000.00
Private Sector	Dioki	Equity	Investment mobilized	1,631,758.00
Private Sector	Dioki	In-kind	Recurrent expenditures	10,000.00
Private Sector	Eryap	Equity	Investment mobilized	110,000.00
Private Sector	Eryap	In-kind	Recurrent expenditures	10,000.00
Private Sector	Izocam	Equity	Investment mobilized	333,034.00
Private Sector	Izocam	In-kind	Recurrent expenditures	10,000.00
Private Sector	ODE	Equity	Investment mobilized	23,050.00
Private Sector	ODE	In-kind	Recurrent expenditures	10,000.00
Private Sector	Ravago	Equity	Investment mobilized	5,050,757.00
Private Sector	Ravago	In-kind	Recurrent expenditures	10,000.00
Private Sector	Wallboard	Equity	Investment mobilized	158,423.00
Private Sector	Wallboard	In-kind	Recurrent expenditures	10,000.00

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Ministry of Environment and Urbanization of Turkey (MoEU)	Grant	Investment mobilized	5,807,200.00
Recipient Country Government	Ministry of Environment and Urbanization of Turkey (MoEU)	Grant	Investment mobilized	1,024,800.00
Recipient Country Government	Ministry of Environment and Urbanization of Turkey (MoEU)	In-kind	Recurrent expenditures	1,152,480.00
<b>Total Co-Financing(\$)</b>				<b>26,259,954.00</b>

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

?Investment Mobilized? represents the capital investment being made by the ten (10) beneficiary private sector enterprises (4 in the XPS sector and 6 in the EPS sector) in capital equipment/infrastructure, R&D, and product development required to eliminate the use of HBCD through conversion to non-POPs flame retardants in their production. Smaller amounts of investment mobilized involve upgrading laboratory capability within a product certification laboratory supported by the sector industry associations.

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

<b>Agency</b>	<b>Trust Fund</b>	<b>Country</b>	<b>Focal Area</b>	<b>Programming of Funds</b>	<b>Amount(\$)</b>	<b>Fee(\$)</b>
UNIDO	GET	Turkey	Chemicals and Waste	POPs	3,195,000	303,525
<b>Total Grant Resources(\$)</b>					<b>3,195,000.00</b>	<b>303,525.00</b>

**E. Non Grant Instrument**

NON-GRANT INSTRUMENT at CEO Endorsement

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Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

**F. Project Preparation Grant (PPG)**

PPG Required

**PPG Amount (\$)**

120,000

**PPG Agency Fee (\$)**

11,400

<b>Agency</b>	<b>Trust Fund</b>	<b>Country</b>	<b>Focal Area</b>	<b>Programmin g of Funds</b>	<b>Amount(\$)</b>	<b>Fee(\$)</b>
UNIDO	GET	Turkey	Chemical s and Waste	POPs	120,000	11,400
<b>Total Project Costs(\$)</b>					<b>120,000.00</b>	<b>11,400.00</b>

## Core Indicators

### Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	1000	0	0	0
Expected metric tons of CO <sub>2</sub> e (indirect)	1000	0	0	0

### Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)				
Expected metric tons of CO <sub>2</sub> e (indirect)				
Anticipated start year of accounting				
Duration of accounting				

### Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	1000			
Expected metric tons of CO <sub>2</sub> e (indirect)	1000			
Anticipated start year of accounting	2020			
Duration of accounting				

### Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
Target Energy Saved (MJ)				

### Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)



Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)
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Indicator 9 Reduction, disposal/destruction, phase out, elimination and avoidance of chemicals of global concern and their waste in the environment and in processes, materials and products (metric tons of toxic chemicals reduced)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
770.00	7,436.00	0.00	0.00

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

POPs type	Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
SelectHexabromocyclodecane (HBCDD)	770.00	7,436.00		

Indicator 9.2 Quantity of mercury reduced (metric tons)

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

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

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

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

<b>Metric Tons (Expected at PIF)</b>	<b>Metric Tons (Expected at CEO Endorsement)</b>	<b>Metric Tons (Achieved at MTR)</b>	<b>Metric Tons (Achieved at TE)</b>
110,000.00	2,083,000.00		

**Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment**

	<b>Number (Expected at PIF)</b>	<b>Number (Expected at CEO Endorsement)</b>	<b>Number (Achieved at MTR)</b>	<b>Number (Achieved at TE)</b>
<b>Female</b>	100	182		
<b>Male</b>	400	1,178		
<b>Total</b>	500	1360	0	0

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

Indicator 9: Data supporting these and the methodology associated with their calculation applicable to this core indicator are documented in Table 2 and Paragraph 18 for the EPS sector and Table 3 and Paragraph 21 for the XPS sector, and are further elaborated under Global Environmental Benefits in Paragraph 38. Indicator 11: Indicator has been calculated based on the baseline numbers provided by the primary stakeholders during the PPG phase that have been supported by the Gender Assessment and it considers men and women participation at the project management/supervision level and men and women participation in the enterprises.

## **Part II. Project Justification**

### **1a. Project Description**

#### **describe any changes in alignment with the project design with the original pif**

1. The following provides details and justification for the changes to project design made in relation to the original PIF. As a contextual basis for these changes, the following also provides background on the linkage to the project's development history which was the main reason for the project design changes made during the PPG stage and the resultant significant improvements in what the project will achieve in terms of Turkey's Stockholm Convention compliance and global environmental benefits.

2. The original PIF for this project was submitted and technically approved under GEF-6 in 2016 as a timely response by Turkey to the addition of HBCD in Annex A of the Stockholm Convention (SC) and its identification as a priority in the SC National Implementation Plan (NIP) update being completed by Turkey at that time, and the legal assumption by the country of the elimination obligations associated with putting this amendment into force. However, due to GEF-6 funding issues final approval of the project for funding at that stage was deferred and the PIF was re-submitted in October 2018 and approved in December 2018 in the same form originally technically approved in 2016. During the period between the preparation of the original GEF-6 PIF and its final approval as a GEF-7 project, the government and private sector enterprises in both the EPS and XPS sectors moved forward jointly and proactively with significant preparatory action predicated on the assumption that originally contemplated GEF support would materialize. Upon initiating the detailed preparation of the project in early 2019, it was apparent that some changes in the original project design were appropriate and in fact this proactive action by the government and enterprises would allow expansion of the project scope to cover complete elimination of HBCD in the country within the same grant resources, rather than be limited to a relatively few demonstration conversions in selected enterprises. In addition, the significant technical and market developments respecting the availability of environmental sound alternatives to HBCD that had occurred allowed the project's technical assistance in this area to become more focused on in-plant support and on ensuring a level playing field between large and small enterprises across both sectors. Similarly, the active actions by the government in establishing the framework regulation have allowed a more directed approach to the project's institutional and regulatory capacity building support, by placing a greater emphasis on enforcement and elimination sustainability as well as integrate efforts specific to HBCD with government and bilateral programs on chemicals management and POPs contaminated waste management. In summary, the original justification for the project, namely to allow the country to initiate the institutional, technical capacity strengthening and investment needed to start the phaseout of HBCD in accordance with the countries Stockholm Convention Obligations remains with the substantial enhancement allowed by the proactive action by government and the private sector to expand this to encompass a full elimination of HBCD use in the country.

3. The table provides a line by line comparison of the Project Framework as defined by Components, Outcomes and Outputs at the PIF and PPG stages. Overall, the original four Component structure is maintained with Component 1 addressing regulatory strengthening and capacity building, Component 2, addressing elimination of HBCD use in the EPS sector, Component 3 addressing elimination of HBCD use the XPS sector and Component 4 addressing Monitoring and Verification. However, based on the results of substantive PPG stage consultation and draft project framework reviews by institutional and private sector stakeholders/beneficiaries, restructuring based on the current state of development in addressing the issue and collective stakeholder input restructuring of Outcomes and corresponding Outputs was undertaken to make it more effective and efficient in serving country needs as well as achieving the project objective. The following provides a more detailed summary in tabular form of the specific changes made and the rationale in each case by component.

<b>Component</b>	<b>Changes from PIF</b>	<b>Rationale/Justification</b>
Component 1: Regulatory strengthening, capacity building, stakeholder awareness and verification of environmentally sound alternatives for the replacement of HBCD	At the Component level the scope remains essentially the same except with the addition of explicit acknowledgement of a stakeholder awareness priority at this level.	The addition of stakeholder awareness at the component level was done at MoEU's request recognizing proactive enactment of regulations banning use of HBCD combined with the delay in anticipated GEF support required a greater emphasis by government in supporting external stakeholders, particularly the private sector enterprises directly impacted, with outreach from government to maintain support for the initiative.

	<p>At the Outcome level, the original two Outcomes have been changed. Outcome 1.1 has been refocused from evaluation and national approval of alternatives to information dissemination on available alternatives now adopted internationally. Outcome 1.2. supporting regulatory action has now placed greater emphasis on support enforcement, particularly respecting imports of HBCD containing product, and product performance and chemical content monitoring in the market. In addition, a new Outcome 1.3 has been added to address HBCD contaminated waste material.</p>	<p>These changes reflect firstly the imperative identified by MoEU above related to coordinating and mitigating negative stakeholder public reaction to the proactive regulatory response and delay in support for enterprises in being able to technically achieve compliance, particularly with smaller, more vulnerable but economically important enterprises. Secondly, the change in focus to information transfer and general technical support delivered by MoEU reflects the rapid evolution and market availability of environmentally safe alternative FRs to HBCD and their wide adoption in developed countries, particularly Europe. Thirdly, the proactive adoption of a basic regulatory framework allows the change in focus to enforcement which is seen as critical by both government and the private sector in maintaining a level playing field in the market. Finally, the addition of Outcome 1.3 reflects the input from MoEU respecting support for its broader program priority initiatives respecting POPs contaminated wastes as contained in its NIP update. While it potentially could have been included as an activity under Outcome 1.2, it was requested to be included as a standalone Outcome to facilitate its administration within MoEU's structure and integration with the MoEU programming and bilateral support in the subject area.</p>
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	<p>At the Output level for all three Outcomes, specific targeted new Outputs consistent with the restructured outcomes have been developed.</p>	<p>While the current Outputs remain directionally consistent with the very general Outputs listed in the PIF, they are now presented in a more focused fashion reflecting the current situation, knowledge base and specific priorities of stakeholders. Specific examples of this are: i) targeted outputs covering international technical documentation on alternatives and dissemination of such technical information in workshops through MoEU sponsorship (Outputs 1.1.1 and 1.1.2); ii) enforcement regulatory support capacity with specific targets for elimination of HBCD imported product and production inputs identified and training and field capability support for final product monitoring both identified as critical to ensure a level playing field in the phase out process and long term sustainability of HBCD phase out (Outputs 1.2.1 and 1.2.2) iii) specific emphasis on supporting HBCD containing waste management strategies within the broader national regulatory and capacity development programming in this area (Output 1.3.1)</p>
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<p>Component 2: Elimination of HBCD use in the EPS sector in Turkey</p>	<p>At the component level for both Components 2 and 3, the significant change is their scope expansion from the relatively modest demonstration of HBCD replacement in two enterprises in each sector to complete of elimination of HBCD use in all national pre-blended PS and XPS producers (a total of 10 enterprises), supported by targeted TA provided individually to enterprises and through engagement of the industry associations. Additionally, the grant allocation to these two Components, while unchanged in total has been modified with a greater allocation to the EPS sector and lesser allocation to the XPS sector.</p>	<p>The overall justification for this change is the ability to achieve substantially greater HBCD elimination hence the GEBs fundamental to the project objective. In the detail, this change reflects up to date and a more technically accurate assessment/technical characterization of the sectors and what is required for replacement than was undertaken at the PIF stage. Likewise, the TA support reflects the current state of knowledge respecting available alternatives and a greater focus on production technique capability rather than the modality involving production line replacement inherited from MLF projects under taken previously which is not generally applicable in practice. The increased allocation of grant funds to the Component 2 EPS sector and corresponding decrease in Component 3 XPS sector reflects the factual reality that the EPS sector is the highest direct consumer of HBCD, therefor provides greater impact in GEB term and it requires more investment for elimination of HBCD. This is also reflected in the corresponding co-financing being made available by the EPS sector.</p>
<p>Component 3: Elimination of HBCD use in the XPS sector in Turkey</p>		

	<p>At the Outcome level for both components, this has changed to being more clearly differentiated between target TA and actual support for investment requirements. Outcomes 2.1/3.1 and 2.2/3.2 provides focused TA addressing individual international expert advice focused on plant specific operation in conversion to environmentally sound FRs and collect information provision through the industry association respectively. Outcomes 2.3/3.3 cover the disbursement of funds supporting eligible investments based on a performance based/phase out achieved methodology subject to independent verification and monitoring, rather than direct involvement in procurement of production line equipment as contemplated in the PIF.</p>	<p>The justification for these changes is essentially that at the PPG stage where all potential beneficiary enterprises were identified, the technical characteristics and investment requirements were identified in detail and the TA priorities of enterprises were identified with their direct input all of which resulted in more focused and simpler structure at this level, all when compared to the limited knowledge base that was available or acquired at the PIF stage. This structure removes generalities and speculative results contained in the original PIF and enhances the efficiency and definition of activities for purposes of implementation.</p>
	<p>Changes made at the Output level for both components generally track those at the Outcome level being more specific and focused. It is noted an additional Output 2.2 exists in Component 2 Outcome 2.2 related to supporting industry-based laboratory capability for product testing and certification.</p>	<p>The justification for these changes is essentially the same as outlined above given that in all but one case a single Output corresponds to each Outcome. The exception noted relates to Output 2.2 covering laboratory capacity support. This is placed in Component 2 because the laboratory involved is under the EPS sector industry association but will serve both the EPS and XPS sectors.</p>
Component 4 Monitoring and Evaluation	<p>Change made under the M&amp;E Component is that the MTR will be undertaken by the Project Executing Entity (PEE) instead of UNIDO.</p>	<p>The motivation of this change is based on the latest policy guidance from the GEF regarding the MTR.</p>



**1a. Project Description. Elaborate on: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description); 2) the baseline scenario and any associated baseline projects; 3) the proposed alternative scenario with a brief description of expected outcomes and components of the project; 4) alignment with GEF focal area and/or Impact Program strategies; 5) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing; 6) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 7) innovativeness, sustainability and potential for scaling up. ?**

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

4. 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. In November 2014, one year after notification, the amendment to add this substance entered into force for most countries party to the Convention and, therefore, these countries are required to prepare action plans to ban and/or restrict the uses/applications, productions, import, and export of HBCD as well as to eliminate stockpiles and obsolete HBCD.

5. HBCD (CAS Number 3194-55-6) is a poly-brominated white crystalline powder. Commercial HBCD is mainly composed of three isomers, of which gamma-HBCD accounts for about 70-95%, while alpha and beta-HBCD range between 5-30%. It is mainly used as a flame-retardant additive, reducing flammability during the service life of vehicles, buildings or articles, as well as protection while stored. Its primary application is in the manufacturing of expanded polystyrene and extruded polystyrene (EPS and XPS, respectively) boards, which are used for insulation purposes in the building industry. Other uses are in upholstered furniture, automobile interior textiles, car cushions and insulation blocks in trucks, packaging materials as well as electric and electronic equipment.

6. The current production processes in the EPS and XPS foam industries have a number of global chemicals related impacts on the environment which are now being addressed in parallel initiatives under both the SC and Montreal Protocol. In the context of this project, production, use and disposal of HBCD flame retardant used in these products results in release of the chemical into the environment. HBCD has a strong potential to bioaccumulate and biomagnify, is persistent in the environment, has a potential for long-range environmental transport, is toxic to aquatic organisms, and has observed neuroendocrine and developmental toxicity potentially impacting humans, particularly vulnerable groups. Likewise, the production of EPS and XPS foams has traditionally involved the use and resultant emission of ozone depleting substances (ODS) and GHG blowing agents with HFC replacements. These chemicals are greenhouse gases with significant global warming potential (GWP).

Phase out of hydrochlorofluorocarbons (HCFCs) is being completed under the Montreal Protocol (MP) in developing countries and with the adoption of the Kigali Amendment to the MP, hydrofluorocarbon (HFC) blowing agents used as a HCFC replacement is now targeted for phaseout due to their high GWP. Generally, the EPS and XPS sectors which themselves produce products critical to energy efficiency and consequential reduction in climate impacts are faced with a critical need for technology change in adapting to these coincidental global chemicals convention requirements in a manner that maintains high standards applied to insulating products that satisfy three critical objectives, namely protection of public safety and property in terms of fire protection, elimination of POPs use and release, and GHG reduction through maintaining and increasing energy efficiency.

7. Estimates of global production of HBCD made in 2011 by the SC Persistent Organic Pollutants Review Committee (POPRC) at its eighth meeting in preparation for inclusion of HBCD as an Annex A POP was 31,000 t/year, almost exclusively produced in China, Europe and the US. Updated information provided to UNIDO by producers of flame retardants indicates an estimated total production of some 40,000 t globally when the bans on its use came into effect in the EU and other developed countries. Global production has dropped with the elimination of production in compliance with the SC in most developed countries including Europe and North America but production continues in China under a requested compliance extension until 2021. 2011 production in China was reported as 18,000 t of which 5,500-6,000 t was exported. 2018 production is understood to remain at this level. In terms of global HBCD consumption, 90% has historically been attached to the EPS and XPS sectors with the split between the two sectors typically being biased to the EPS sector which typically accounts for in excess of 70% of consumption. Concentrations of the chemical in EPS are typically in the range of 5,000-10,000 mg/kg and in XPS in the range of 8,000-25,000 mg/kg. Globally, consumption is now largely restricted to developing countries with major traditional developed country consumers in North America, Europe and Japan having effectively banned HBCD use in domestic and export production of EPS and XPS. China is the largest global consumer with a reported 2017 consumption of 14,660 t. Turkey as major industrialized developing country is also a major consumer with in excess of 2,000 t/year in 2017 thus a major remaining international market for HBCD.

8. There are several available chemical alternatives to HBCD-based flame retardants have now come into commercial use globally as extensively documented in guidance documents issued by the SC. The most current of these which includes a comprehensive review of references on the subject is entitled "Guidance on alternatives to Hexabromocyclododecane (HBCD)" dated January 2019<sup>[1]</sup>. The most commonly used alternative flame retardant is a brominated co-polymer of styrene and butadiene (Benzene, ethenyl-, polymer with 1,3 butadiene) generally referred to as Polymeric FR (CAS No: 1195978-93-8) which is patented by a major multi-national chemical company and manufactured by at least three licensees in Europe, Israel and the US. This chemical is widely used as a direct drop in alternative replacing 50% of previous global demand for HBCD, primarily in Europe, the US, Japan and some Western Asian countries for both EPS and XPS. The above referenced SC guidance also identifies a number of other alternatives that are generally referred as monomeric brominated FR chemicals including Tetrabromobisphenol A-bis brominated ether derivative (CAS No:97416-84-7)

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which is understood to be produced in Europe and China commercially under a number of trade names for both EPS and XPS applications and several others that have some more limited commercial production and selective applications in these sectors.

9. Given that all commercial chemical alternatives to HBCD are also brominated chemicals with an aromatic structure they have: i) potential to form brominated dioxins at end of life disposal involving incomplete combustion; ii) can be subject to UV degradation resulting in the formation of brominated aromatic substances; and iii) as they rely on the same chemical mechanism as HBCD to achieve FR properties may also exhibit similar characteristics respecting toxicity and persistence in the environment. The latter is a significant consideration and barrier to users in selecting an optimal alternative. In that regard, the current market dominance of the polymeric styrene and butadiene copolymer alternative is in part attributable to the assessment that these have a relatively low potential to result in persistence in the environment relative to the monomeric alternatives. Due to its large size, lack of low molecular weight (MW) components, and un-reactive functional groups, human health and ecotoxicity hazard for this polymer are measured or predicted to be low. Likewise, the exposure potential to the butadiene-styrene brominated copolymer is expected to be lower than the other chemicals because it is a large polymer and is unlikely to be released from the polystyrene. On the other hand, the monomeric polymers have been assessed at least on a preliminary basis as likely to exhibit similar characteristics as HBCD in terms of persistence and toxicity as found with HBCD, thus potentially being subject to national regulatory control action and potentially international controls under the Stockholm Convention in the future.

10. There is also potential for non-chemical alternatives that can be applied. One class of these involves the use of EPS and XPS without FR but with building designs that ensure a thermal barrier that prevents combustion of the insulation. An example of this is placing it under cement floors. A second approach is to use alternative insulating material that are inherently non-flammable such as mineral wool, fibre glass wool and polyurethane rigid foams. The major barriers to these options are relative economics, the selective suitability of various alternative materials in specific applications, and in some cases the need to revise building codes which is a time-consuming process.

11. The accumulated legacy waste contaminated with HBCD and, into the future, brominated chemical alternatives is also an issue that needs to be considered within the overall scope of dealing with past and future wastes containing FRs. A waste stream containing HBCD and likely other brominated chemicals in the future is generated during the production of EPS and XPS. Currently, strategies for waste minimization and recycling at source are limited. More significantly, substantial quantities of EPS and XPS containing HBCD are in service and will be for many years, but will also at some point become part of the general demolition waste stream and ultimately be subject to release. A similar issue applies to older XPS and EPS wastes which contain ODS and F-gas blowing agents which themselves represent global environmental atmospheric and climate impacts upon eventual release. Current waste management infrastructure and technologies to effectively manage these legacy wastes

in an environmentally sound manner is limited and require development in both developed and developing countries.

12. Overall the global environmental problem, its root causes and barriers to addressing the question of HBCD elimination in developing industrialized countries such as Turkey for EPS and XPS production may be framed as a combination of: i) access to currently available alternative technology, particularly environmental sound chemical alternatives that can be readily applied to existing production facilities and infrastructure; ii) required product development and testing that is required to test, optimize and certify product with alternatives; iii) accomplishing such elimination/conversion in a manner that maintains the economic viability of established producers of these critical building and packaging materials; and iv) ensuring that a transparent and equitable regulatory regime exists to both allow time to accomplish this and ensure fair commercial market with respect to imports.

## **2) Baseline scenario and any associated baseline projects;**

13. The Republic of Turkey signed the SC on May 24/2001, ratified it on October 14, 2009 to come into force December 1, 2010. The country submitted its original National Implementation Plan (NIP) in 2009 and since that time has put into effect all amendments to the SC including amendments pertaining to inclusion of HBCD in Annex A (November 11, 2014). A formal NIP update was submitted in November 2016 which identified HBCD as a priority and was the basis of the original high level indicative baseline estimates of HBCD consumption in the EPS and XPS sectors stated. It was determined that no HBCD production occurred in Turkey. No HBCD production in Turkey existed and all HBCD used was imported, either as pure chemical or contained in the polystyrene beads used as the main input to XPS production. The NIP Action Plan includes the elimination of HBCD in the EPS and XPS sectors and the explicit intention to accomplish this by 2019 with the anticipated pending support of the GEF. In terms of consumption, the inventory work undertaken at that time and contained in the updated NIP indicated that, based on the import and export statistics between 1985-2013, the estimated inventory HBCD accumulated in products produced in Turkey during that period was 3,823 t in EPS, 12,852 tonnes in XPS and 14 tonnes in Polystyrene waste or scrap. The annual breakdown of the import-based inventory (NIP Update Document, Table AIV/5 PageA31) indicates in the last year reported (2013), HBCD consumption was 350 t in the EPS sector and 1,058 t in the XPS sector (Total ? 1,408 t). It was also noted that the use of large volumes of HBCD is relatively recent, having begun in 1989, but has steadily increased over the period with most being used for XPS. However, the latter years of the data show relatively constant use for XPS while there is a more rapid increase in use in EPS.

14. The other actions initiated by the Government as part of its ratification of the 2014 inclusion of HBCD under Annex A of the SC and initial preparation of the GEF-6 PIF was for MoEU to undertake consultation with industrial stakeholders on managing the phase out process during the 2014-16 period. As a result, after 2016, action in three areas were undertaken on the strength of the technical approval of the submitted GEF PIF. These were: i) active users of HBCD in both sections initiated technical work on HBCD alternative selection, product development and required investment (described in detail below under the alternative scenario); ii) the Government of Turkey formally

registered for a temporary exemption[2]<sup>2</sup> for permitted use of HBCD[3]<sup>3</sup> in accordance with Decision SC 6/13[4]<sup>4</sup> on the basis of its continued use in the EPS and XPS sectors in November 2014; and iii) MoEU developed and in 2018 promulgated an amendment to the Regulation on Persistent Organic Pollutants[5]<sup>5</sup> specifying target phase out dates in the EPS (November 28, 2019) and phaseout for XPS effective the date the amendment came into force (November 14, 2018), that would achieve elimination of HBCD use as targeted in the NIP update.

HBCD Use in the EPS Sector in Turkey.

15. The principle characteristic of the EPS sector is that it has a large number of small and medium size enterprises producing final products with and without FR depending on the product application. The actual consumption of HBCD or alternative FR occurs in producers of the primary input used by these final producers in the form of pre-blended polystyrene (PS) typically prepared in bead form. Historically in Turkey, the original producers of final EPS products imported the pre-blended PS, largely from Europe and a lesser degree from Asia. However, there has been increasing expansion of domestic production of this intermediate product, with and without FR over the last decade to the point where the four domestic producers account for over 60% of the market and the two largest producers have started exporting, mainly to Europe. Table 1 below provides a summary of the production and trade dynamics for the pre-blended PS between 2015-2018 that shows the current development of this business including that part of it involving the use of FRs. It should be noted that usage of FR in imported product from the EU is assumed not to contain HBCD since its production, use, import and export was banned in March, 2016[6]<sup>6</sup>. However, usage of FR in imports from the Far East are assumed to contain HBCD given continued production of HBCD in China. In terms of exports, 2018 data made available by individual pre-blended PS producers indicated that total exports of pre-blended PS were 96,1530 t almost exclusively from the two largest producers and involving product using non-HBCD FR. A small quantity (1,679 t) mainly containing HBCD was manufactured by the two smaller producers for export to developing countries in the region.

Table 1: Market Data Applicable to Turkish Domestic and Imported Pre-Blended PS (t/yr.) in Turkey ? 2015-2018

<b>Market and HBCD Usage (t/yr.)</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>TOTAL EPS pre-blended PS market</b>	<b>230,000</b>	<b>232,000</b>	<b>239,000</b>	<b>238,000</b>
<b>DOMESTIC PRODUCTION</b>	130,000	138,000	148,000	154,000
Usage of FR based on HBCD	792.80	989.00	997.42	823.84

<b>IMPORT PRODUCT</b>	100,000	94,000	91,000	84,000
Import from EU	63,000	60,000	59,000	55,000
<i>Estimated Usage of FR</i>	567	540	531	495
Import from Far East	37,000	34,000	32,000	29,000
<i>Estimated Usage of FR</i>	278	255	240	218
<b>TOTAL USAGE OF FR</b>	<b>1,637.30</b>	<b>1,784.00</b>	<b>1,768.42</b>	<b>1,536.34</b>

Source: EPSDER Industry Association

16. The structure of the overall EPS sector consists of four producers of pre-blended PS who supply over 100 end users that produce final EPS product. The overall sector employs approximately 5,000 people with an additional 30,000 associated with dealer networks, sales and product installation. Given that the producers of the pre-blended PS are the HBCD consumers and there is minimal impact of its conversion to alternatives meeting the same requirements at the final product production level as obtained with HBCD based production, these four enterprises represent the main target beneficiaries of this project. Both the final EPS product producers and the pre-blended PS producers are members of an industry association known as EPSDER (Turkish EPS Industries Association) based in Istanbul. Other members include various chemical, services, and equipment suppliers. EPSDER also support CEVKAK which is an independent private sector laboratory providing analytical, testing, and product certification services to the EPS sector and are also available to provide services to the XPS sector. In global terms, the Turkish EPS sector is the largest in the immediate region (Middle East and Central Asia) and considered the third largest in the European region.

17. The four producers of pre-blended PS are generally profiled as follows and in Table 2 below which provides a summary of HBCD consumption in the period 2015-18:

? *Ravago*: This producer is the EPS division (Eastchem) of the Ravago Petrokimya Uretim A.S that is the Turkish operation of the Ravago global petrochemical and plastics group based in Belgium. The Eastchem Division was founded by Monotez in 2006 as Turkey's first EPS manufacturing facility and was acquired by Ravago in 2012. It is the largest EPS producer in Turkey, with production operations are located in Izmir having a capacity of 200,000 t/year and 2018 production of 187,000 t/yr. Of this 74,800 t (all containing non-HBCD FR) was exported and 112,200 used domestically (50,500 with HBCD FR). Conversion to non-HBCD fire retardant began in 2017 based on the pending implementation of bans on HBCD in the country and demand from EU export markets where HBCD was already banned.

? *CFN Kimya*: This is a nationally owned company whose primary business is EPS pre-blended PS production and was founded in 2013 with plant facilities in Dilovas?, Kocaeli. It is the second largest producer in the country with rated production capacity of 100,000 t/year and 2018 production of 46,380 t/year (18,712 t and 21,520 with non-HBCD FR directed to export and domestic markets

respectively and the remainder without FR for food contact EPS products). The company-initiated conversion to non-HBCD fire retardant began in 2017 based on the pending implementation of bans on HBCD in the country and on demand from EU export markets. The company currently employs 75 people.

? *Aschem*: This is a domestically owned petrochemical company founded in 2000 and who has produced pre-blended PS since 2015 at Adana. It declares a production capacity of 34,500 t/year and had 2018 production of 14,014 t., almost all for domestic sales and 8,996 t was HBCD containing product with the remaining production for food contact applications.

? *D?OK? Petrokimya San. A.?.:* This is a domestically owned company that started production of pre-blended PS at Adana in 2016 based on a plant purchased and moved from Croatia. It declares a production capacity of 17,000 t/year and had 2018 production of 9,133 t. of which 2,070 t was exported including 1,068 t of HBCD containing product as well as producing 6,058 t of HBCD containing product for domestic sales.

Table 2: Summary of HBCD consumption 2015-18 for producers of pre-blended polystyrene used in EPSs production

Company	2018 Production Data (t/yr.)			Consumption of FR based on HBCD (kg/year)				
	Capacity	Production	HBCD Production	2015	2016	2017	2018	Average for 2016-2018
Ravago	200,000	187,000	50,500	561,600	752,900	818,500	735,200	768,867
CFN	100,000	46,380	0	225,000	172,000	55,000	no usage	133,500*
Aschem	34,500	14,015	8,425	6,200	41,105	83,920	44,641	56,556
Dioki	17,000	9,133	7,648	-	23,000	40,000	44,000	35,667
Totals	351,500	263,328	66,573	792,800	989,005	997,420	823,841	974,590

Source: PPG direct survey data provided by participating companies

\*Average of 2016-17

18. Overall, the EPS sector as represented in the context of domestic producers of pre-blended PS had an average consumption for the period after initiation of measures nationally and the initial

development of a GEF project (2016-2018) of 974,590 kg/year. Based on data from EPSDER, an additional average import of 239,667 kg/year pre-blended PS containing HBCD was imported for direct sale to final EPS product producers. On this basis, the baseline HBCD consumption for the project established as 1,214,167 kg/yr.

#### HBCD Use in the XPS Sector in Turkey

19. The XPS sector differs from the EPS sector in that it utilizes HBCD directly in its final production process. All of the production requires FR and has up to the present utilized HBCD. In addition, it is based largely on a domestic market with minimal import or export, largely because of the transportation barriers associated with such a low-density high-volume product. The sector is made up of seven identified domestic producers six of whom are participating in this project<sup>[7]</sup>.

20. The six national producers of XPS participating in the project are generally profiled as follows and in Table 3 below which provides a summary of HBCD consumption in the period 2015-18:

? *Wallboard Insulation Panels*: This company started in 2005 and has an XPS production facility located in Nurdagi, Gaziantep with a capacity of 450,000 m<sup>3</sup>/year and 2018 production of 446,000 m<sup>3</sup>. The company is also an EPS end product producer.

? *EYRAP*: This company started in 2001 and has an XPS production facility located in Silivri, Istanbul with a capacity of 450,000 m<sup>3</sup>/year and 2018 production of 242,300 m<sup>3</sup>.

? *IZOCAM*: The company was established in 1965 and started XPS production in Gebze in 1995 that was expanded in 2011 where there is now 560,000 m<sup>3</sup> of capacity. It also produces XPS at a 90,000 m<sup>3</sup> capacity plant at Tarus. 400,000 m<sup>3</sup> of this overall capacity utilizes FR of which 295,215 m<sup>3</sup> was produced in 2018. The company is also an EPS final product producer.

? *ODE*: This company was established in 1965 as an importer and established national manufacturing of a range of insulation building products in 1996, including XPS production being started in 2001 with expansions in 2008 and 2011 at plant facilities in Ergene, Terirdag with a current installed capacity of 250,000 m<sup>3</sup> and 2018 production of 140,000 m<sup>3</sup>.

? *DINAMIK*: This company is a national manufacturer of a range of insulation building products dating from 1996 which added XPS to its product range in 2010 and expanded capacity in 2015 such

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that its current capacity is 130,000 m<sup>3</sup>/yr. at its plant in Tire, Izmir. 2018 production was 91,614 m<sup>3</sup>. It employs 98 people.

? *BTM*: This company is a national manufacturer of building and insulation products since 1986 that started XPS production in 1995 at a facility in Izmir which now has an installed capacity of 44,500 m<sup>3</sup>/yr. and 2018 production of 29,457 m<sup>3</sup>. It also operates an XPS plant in Kazakhstan.

21. Overall, the XPS sector had an average consumption for the period after initiation of measures nationally and the initial development of a GEF project (2016-2018) of 77,967 kg/year which is considered the baseline XPS sector HBCD consumption for the project.

Table 3: Summary of HBCD consumption 2016-2018 for participating producers of XPS

Company	2018 Production Data t/yr.		Consumption of FR based on HBCD (kg/year)			
	Capacity	Production	2016	2017	2018	Average for 2016-2018
Wallboard	450,000	446,000	294,000	340,000	248,000	294,000
ERYAP	450,000	242,300	173,000	161,000	126,000	153,333
IZOCAM	400,000	295,215	105,100	94,900	74,250	91,419
ODE	250,000	140,000	n/a/	31,773	21,515	24,306
DINAMIK	130,000	91,614	36,560	39,854	44,986	40,667
BTM	44,498	29,457	33,000	11,640	25,000	23,213
Ravago/ DOW	Not available	Not available	80,230	80,920	72,750	77,967
Totals	1,814,586	1,244,586	753,694	749,805	604,923	704,706

Source: PPG direct survey data provided by participating companies

#### Baseline Projects

22. The principle baseline projects supporting the current project are the above mentioned: i) NIP Update work undertaken using GEF support with UNIDO as implementing agency<sup>[8]</sup>, and ii) EU project of the Technical Assistance for the Implementation of the Persistent Organic Pollutants

Regulation[9]<sup>9</sup>. The outputs of these two projects resulted in the submitted NIP update document which initiated national action by both the government and industry on the elimination of HBCD as well as informing the preparation work for this project. In addition, EU financed IPA projects have supported chemicals management initiatives generally related to development and implementation of a regulatory framework for chemicals compatible with international chemicals control and trade practice, particularly the EC REACH regulation. This work has resulted in the introduction of the KKDIK regulation in 2017 and being developed to fully be in force in 2021-22. This and continuing EU support under this IPA project in a second phase is described in more in following sections. Also relevant in the context of a baseline project is the completing GEF UNDP/UNIDO project on POPs Legacy Elimination and POPs Release Reduction[10]<sup>10</sup> which successfully qualified national capability for POPs waste destruction.

#### Regulatory Framework for Chemicals, POPs and HBCD

23. Turkey's overall legislative and regulatory framework governing chemicals and specifically POPs as controlled under the SC is summarized in Tabular form in Annex III of the above referenced NIP update as effective up to 2015. This includes Tables specific to National legislations on chemicals management (Table III/2), National legislations on management of pesticides (Table III/3), National legislation on management of POPs wastes (Table III/4), National legislations setting the discharge and ambient quality standards (Table III/5), and Turkish Legislations in accordance with Stockholm Convention's Legal Liabilities (Table III/6).

24. Since 2015, the legislative and regulatory framework governing chemicals management and POPs has been generally expanded and various gaps in it addressed as reflected in the following list of initiatives and activities that are relevant to HBCD and this project. These activities are as follows:

? Updating and amending POPs Regulations consistent with current amendments in the SC including implementation of the technical aspects of Turkish subordinate legislation on POPs connected with the new and candidate POPs.

? Supporting by-laws and administrative measures to support the Updated NIP.

? Harmonization of Turkish legislation generally in line with the SC, CRLTAP/POPs Protocol and EU POPs regulation including the subordinate legislation and to use the SWOT Analysis Report for the preparation of the draft by-law on POPs.

? Establishment of the institutional framework for supporting the implementation of the SC, CRLTAP/POPs Protocol and the subordinate legislation and definition and implementation of the coordination process between individual department of the MoEU and other responsible ministries and institutions as key strategic process for successful and effective implementation of the NIP measures.

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? Preparation of guidance documents on POPs.

25. In addition to the above, the two principal regulatory initiatives in this period directly linked to this project are the 2018 regulation setting the dates for banning use and import of HBCD as noted above and the Registration, Evaluation, Permission and Restriction of Chemicals Regulation (known as the KKDIK Regulation). The KKDIK Regulation was introduced in 2017 and is being prepared for wide implementation by 2021-22 utilizing the support of the 1,360,000 Euro second phase of the EU IPA project in harmonization of with the EU REACH system. The scope of KKDIK Regulation as introduced is intended to monitor imports 1 t of chemicals or more in principle where they ban the market supply of imported chemicals unless registered on an official list. Officially, prohibited chemicals will not be allowed to import to the country. In this context, the chemicals to be banned are added to the list of substances subject to authorization as a priority. Enterprises are requested to give information in any activity such as import, export of chemicals in that list. By means of these notifications, permission for market supply is obtained and how much and how often the chemical is used can be monitored.

26. The final group of baseline regulations directly relating to HBCD and its replacement alternatives are those administered by General Directorate of Construction on the performance, testing and market display requirements of EPS and XPS polystyrene insulation foams and products using this production. These include the Guideline for European Technical Approval of External Thermal Insulation Composite Systems (ETICS) which are used for thermal insulation in buildings and address product specifications, testing, marking and labelling information. National standards documents also include an EPS Product Standard (TS EN 13163 A2) and an XPS Product Standard TS (EN 13164 A1).

27. The initial baseline dating from 2016 was generally defined as the country being fully dependant on the use of imported HBCD in critical insulation applications requiring FRs for public safety and improving energy efficiency as produced by the expanding EPS and XPS sectors that had grown rapidly in the past decade making Turkey a major HBCD consumer globally. The proposed project is therefore critical to continuing the proactive commitment to elimination of this chemical in principle, and specifically in overcoming barriers associated with the application of optimal alternative technologies, both technical and economic, as well as maintaining a stable domestic production base for these critical products that might be otherwise threatened by imports, particularly those retaining HBCD.

3) Proposed alternative scenario with a brief description of expected outcomes and components of the project

28. The alternative scenario proposed through the project's design is to aggressively pursue the complete elimination of HBCD use through the coordinated and integrated proactive efforts of the Government and private sector stakeholders as demonstrated since 2016 with the additional support provided under the GEF grant. The latter will be specifically directed to addressing the barriers that remain to complete the elimination within a time frame provided for under the exemption provisions that Turkey has duly registered for. At an institutional level the project design addresses the key barriers to HBCD use elimination by supporting institutional action by the government that deals with the barriers encountered in completing this as presented by remaining legislative, regulatory and enforcement gaps as well as limited public/stakeholder awareness. More directly, the project adopts a primarily private sector orientation as provided for both through partial compensation of investment being mobilized to implement elimination of HBCD use at the enterprises level and the provision of

international technical and operational capacity building across both sectors and at the individual enterprise level in selection and optimization of HBCD alternatives.

29. As detailed above, the overall project structure is consistent with PIF in the sense that it maintains the same component structure with Component 1 focused on institutional activities led by MoEU and partner stakeholder agencies addressing legislative/regulatory capacity issues as well as dissemination of stakeholder information. Likewise, Components 2 and 3 remain specific to elimination of HBCD use and introduction of environmentally sound alternatives in the EPS and XPS sectors respectively. The main divergence in design from that presented at a conceptual level in the approved PIF is the expansion of the project scope in Components 2 and 3 from just undertaking demonstration investments in HBCD elimination in a relatively few enterprises to supporting investment mobilization on a commercial scale to complete national HBCD use elimination in each sector. In that regard, it is emphasized that the substantive resulting increase in Global Environmental Benefit (GEB) remains consistent with the original Project Objective and will be achieved without any increase in GEF grant resources being proposed thus achieving a major improvement in GEF grant cost effectiveness with the funding envelope originally pipelined by GEF. Another change is modification of the grant allocation between the EPS and XPS sectors between Component 2 and 3 from that proposed in the PIF. This was done in recognition of the dominance of the EPS sector in terms of HBCD consumption and the effective HBCD elimination achieved as well as the more intensive investment requirements in the EPS sector compared to the XPS sector as determined during the PPG stage. While the total grant allocation for the two sectors as proposed in the PIF is maintained the allocation of these funds is now based on 70% for the EPS sector and 30% for the XPS sector. The following provides a more detailed description of the project design and scope for the three operational components as defined by their Outcomes and Outputs as laid out on Part 1 Section B above.

30. Component 1: Regulatory strengthening, capacity building, stakeholder awareness and verification of environmentally sound alternatives for the replacement of HBCD: Component 1 is intended to provide targeted technical assistance with the specific objective of addressing the principle institutional barriers identified as limiting the ability to complete a rapid and sustainable elimination of HBCD to the point of its effective elimination in the EPS and XPS sectors. As introduced above, the barriers are addressed by: i) ensuring that relevant information is effectively disseminated to a broad range of impacted stakeholders such that commitment and acceptance across government, EPS/XPS producers, product users and civil society generally to this initiative is maintained; ii) legislative and regulatory gaps that limit the incentive to complete this undertaking are addressed consistent with other POPs and priority chemicals; iii) barriers associated with control of the import of HBCD and HBCD containing product are eliminated consistent with international practice; and iv) current limitations in terms of strategic policy and infrastructure planning as applied to the management of HBCD stockpiles and HBCD containing waste are addressed. This defines the design approach for the three Component 1 Outcomes as described below. The Component involves a GEF grant of US\$350,000 with government co-financing of US\$10,138,699 and Industry associations co-financing of US\$ 266,200.

? *Outcome 1.1- Up to date non-proprietary information respecting HBCD alternatives and facilitated access to them provided and broad stakeholder awareness on the issue communicated*: This Outcome aims to provide and communicate high-level information on the

HBCD issue including on the technical alternatives available for its replacement, as well as the technical and economic implications of this. To accomplish this, it will provide detailed information of operational conditions/best available operational set up such that production with the alternative FRs can be quickly achieved with maximum efficiency. This responds to a MoEU priority expressed as part of the PPG process that there is a need to ensure a level playing field in terms of technical information availability generally on alternatives and their application in the EPS and XPS sectors, as well as need to ensure awareness of this process in terms of its impact on public safety and national economic and general environmental priorities. The Outcome will be delivered by implementation of two project supported Outputs.

- o Output 1.1.1 involves the preparation and dissemination of up to date global technical references on HBCD alternatives, operational experience with them, and provision of expert contacts which will provide industrial stakeholders in the EPS and XPS sectors with baseline knowledge and tools for undertaking and sustaining transition to environmentally sound alternatives. This activity was initiated by the PPG team during the PPG stage in the course of technical discussions with stakeholders facilitated by MoEU and through provision of initial materials related to current technical references and expert international contacts.

- o Output 1.1.2 involves support for an MoEU administered program involving a series of workshops and other information dissemination mechanisms on alternatives and access to them featuring international and national experts organized and delivered to a broad range of industrial, institutional, academic, and civil society stakeholders impacted by HBCD issue. The latter will specifically include gender awareness and equity promotion.

? *Outcome 1.2 - Regulatory capacity support for control and enforcement to sustained HBCD phase out delivered:* This Outcome supports the efforts by MoEU and supporting agencies particularly the Ministry of Industry and Technology (MoIT), and Ministry of Trade (MoT) in dealing with the outstanding regulatory gaps related to control of use and import of HBCD and HBCD containing products, and enforcement capacity that collectively represent significant barriers to the project's objective of HBCD elimination in the country. In doing so, the strategic approach adopted by MoEU and the supporting agencies is to ensure this is done within a broader framework of the country's overall approach to chemicals managements and particularly ensuring this is effectively harmonized international control practice with particular focus on those operating in the EU. noting Turkey's pre-accession programmes and custom union commitments. The Outcome will be delivered by implementation of two project supported Outputs.

- o Output 1.2.1 addresses the remaining gaps in regulatory control measures within the current framework governing chemicals management and POPs as described above with respect to HBCD and specifically in relation to harmonization of the these regulatory measures with the national legislations related with control of chemicals that provides for strict registration and qualification of chemicals for

purposes of use and trade, inclusive of import of HBCD and HBCD containing products. This process also extends to the chemical alternatives introduced to replace HBCD. Based on available 2018 data this strengthening of customs controls on HBCD imports consistent with international practice will eliminate an estimated 240 t/year of HBCD in imported production inputs in the EPS and XPS sectors.

- o Output 1.2.2 supports the required capacity building and support studies necessary for MoEU to undertake regulatory enforcement of sustained HBCD elimination provided within the above framework. As a specific activity, it supports the Department of Building Materials within MoEU in the application of EPS and XPS product control measures applied to final product containing flame retardants that now extend to newly introduced FR's through training and supporting analytical capability delivered by the Turkish Standards Institute (TSE) and will address introduction of alternative design approaches and materials not requiring chemical FRs.

? *Outcome 1.3 ? Measures for the control and environmentally sound management of HBCD containing waste implemented:* This Outcome is intended to contribute to the broader MoEU initiative respecting the management of POPs containing waste. It is defined by a single Output.

- o Output 1.3.1 addresses the barrier and issue associated with the management of POPs wastes containing HBCD that are generated during current production activities, as a consequence of phase out implementation (stockpiles) and into the future when the useful life of products containing HBCD reach the end of their useful lives. The activities undertaken by MoEU with support of GEF resources for expert consultants will focus on development of a strategy for environmentally sound management of HBCD containing waste including the capture, segregation and speciality treatment and disposal of such waste with emphasis of recovery of resources and raw materials. requirements and options to undertaken. This work is being undertaken within a broader MoEU program framework of developing a national integrated waste management strategy for chemical and chemical wastes generally, including POPs and will link to current and pending bilateral programs.

31. Component 2: Elimination of HBCD use in the EPS sector in Turkey: Component 2 is designed with a focus on private sector beneficiaries in the EPS sector through provision of investment support for elimination of HBCD consumption combined with technical assistance and capacity building at the sector and individual enterprise level to accomplish this objective and address the critical barrier of ensuring that all enterprises have access to the required technical and operational capacity on an equal basis such that competitive equity in the sector is maintained. The component is structured with three Outcomes as described below, the first two of which support technical capacity development related to HBCD elimination and the third provides investment support for phaseout activities. The Component

involves a GEF grant of US\$1,785,000 with private sector co-financing of US\$ 11,294,641 (US\$ 11,254,641 investment mobilized and including US\$ 40,000 USD in kind co-financing).

? *Outcome 2.1- Pre-blended polystyrene (PS) producers have required technical information and capability to complete selection and production of alternative flame retardant containing production:* This Outcome recognizes the general desire of producers to have direct access to international expertise on alternatives to HBCD, and their operational application on an individual basis recognizing competitive and proprietary considerations. It involves a single Output described below:

- o Output 2.1.1 provides the capacity to make optimum competitive decisions on alternative selection, finalize required investment to complete phase out, maintain product certification, optimize production techniques, and support producers of final EPS products in the production of HBCD free product. Noting the uneven distribution in expertise across enterprises and access to such capacity, this would be primarily focused on the two smaller national pre-blended PS producers in the sector who are the least advanced on selection and production conversion to non-HBCD based production as well as product certification.

? *Outcome 2.2 ? National EPS association (EPSDER) is technically supported in its programming to provide collective information and supporting laboratory capability for members on the use of alternative flame retardant in all stages of EPS production:* This Outcome involves partnering with the EPSDER, the sector industry association, in providing collective information and supporting laboratory capability for members on the use of alternative flame retardant in all stages of EPS production.

- o Output 2.2.1 will focus on technical information dissemination on alternatives for the EPS sector is delivered through EPSDER's technical support programming for members. This will be done through provision of resources for supply of technical and market references in Turkish and sponsorship of workshop events utilizing recognized international and national experts.

- o Output 2.2.2 will support upgrading technical capacity within the EPSDER supported CEVKAK laboratory related to product testing and certification for qualification of non-HBCD containing product through modest grant financing of key equipment and training with the resultant capacity being available to both the EPS and XPS sectors.

? *Outcome 2.3 ? Complete phase out of HBCD use in domestic production of preblended polystyrene production (975 t HBCD/year) used in the EPS Sector directed to national markets is achieved:* This Outcome is one of two primary project Outcomes that will achieve the project objective, namely the elimination of HBCD use in Turkey, the other being Outcome 3.3 described below. It relates to the investment required in to accomplish replacement of HBCD with suitable alternatives such that the above documented baseline

HBCD consumption of 975 t/year is eliminated over a three-year period. The GEF grant allocation to this will be US\$1,535,000 with total mobilized investment of US\$9,719,641 across the four participating enterprises in the sector. The overall investment requirements are based on the documented expenditures of each enterprise for preparation and implementation made in the years 2016-2018, plus detailed cost estimates for additional investment required to complete phase out during the project. The investments involve incremental expenditures supporting HBCD phase out and conversion to environmentally sound alternatives in the general categories of capital equipment and production facility modifications, product development, and testing/technical support costs. These expenditures are provided in Table 4 below. The investment made and planned by domestic pre-blended PS producers totals US\$11,254,641 which when deducting the proposed grant allocated for direct enterprise investment support, equals the co-financing stated above for investment mobilized in the sector. The amount of investment generally tracks the production capacity and market share of the respective producers although the allocation between capital equipment investment, and product development and testing/technical support varies between enterprises, something that reflects the individual manufacturing approaches adopted and scaling of production. The overall direct GEF grant cost effectiveness (CE) is US\$1.57/kg but likewise will vary between with larger and smaller producers due to economies of scale. A final decision on the allocation of the block grant assigned to this Outcome between the enterprises has not been made and will be deferred until the inception phase of project initiation. However, analysis undertaken during the PPG stage has evaluated various formula-based distribution methodology options including i) simple equal distribution between enterprises; ii) based on HBCD consumption eliminated; iii) proportional allocation based in total investment, and iv) proportional investment based on future estimated investment. Ultimately, the methodology selected will be based on collective input from all the relevant stakeholders in the proposal review process considering the appropriate balance between achievement of GEB and the need to balance disparity between enterprises in size and basic technical capacity to ensure no competitive inequities are introduced.

Table 4: Incremental HBCD elimination investment undertaken (2016-18) and estimated in future in the EPS Sector Pre-blended PS producers

Enterprise	Cost Category	Phaseout Investment 2016-18* (US\$)	Future Estimated Phase Out Investment (US\$)	Total Estimated Phaseout Investment (US\$)
Ravago	Capital Investment	3,316,038	744,660	4,060,698
	Product Dev. Trials	949,731	0	949,731



	Testing/Tech. Support	40,328	0	40,328
	Enterprise Total	4,306,097	744,660	5,050,757
CFN	Capital Investment	60,000	445,000	505,000
	Product Dev. Trials	2,571,000	400,000	2,971,000
	Testing/Tech. Support	112,500	120,000	232,500
	Enterprise Total	2,743,500	965,000	3,708,500
Achem	Capital Investment	22,573	350,478	373,051
	Product Dev. Trials	81,216	124,948	206,164
	Testing/Tech. Support	236,720	47,691	284,411
	Enterprise Total	340,509	523,117	863,626
DIOKI	Capital Investment	9,860	178,000	187,860
	Product Dev. Trials	621,473	705,285	1,326,758
	Testing/Tech. Support	104,740	12,400	117,140
	Enterprise Total	736,073	895,685	1,631,758
Total		8,126,179	3,128,462	11,254,641

32. Component 3: Elimination of HBCD use in the XPS sector in Turkey: As for Component 2, Component 3 is designed with a focus on private sector beneficiaries in the XPS sector through provision of investment support for elimination of HBCD consumption combined with technical assistance and capacity building at the sector and individual enterprise level to accomplish this objective and address the critical barrier of ensuring that all enterprises have access to the required technical and operational capacity on an equal basis such that competitive equity in the sector is maintained. The component is structured with three Outcomes as described below, the first two of which support technical capacity development related to HBCD phaseout and the third provides investment support for phaseout activities. The Component involves a GEF grant of US\$ 565,000 with private sector co-financing of US\$ 3,380,414 (US\$ 3,320,414 investment mobilized and US\$ 60,000 in-kind co-financing).

? *Outcome 3.1- XPS producers have required technical information and capability to complete selection and production of alternative flame retardant containing production:* This Outcome recognizes the general desire of XPS producers to have access to international expertise on alternatives to HBCD, and their operational application on an individual basis recognizing competitive and proprietary considerations. The single Output is described below.

- o Output 3.1.1 will provide the capacity to make optimum competitive decisions on alternative selection, finalize required investment to complete HBCD elimination, optimize production techniques and maintain product certification of final XPS products that are HBCD free product. Noting the uneven distribution in expertise and access to such capacity, this would be biased as required toward the XPS producers in the sector who are the least advanced on selection and production conversion to non-HBCD based production as well as product certification.

? *Outcome 3.2 ? National XPS association (ISODER) is technically supported in its programming to provide collective information for members on the use of alternative flame retardant in all stages of XPS:* This Outcome involves partnering with the ISODER, the sector industry association, in providing collective information and supporting laboratory capability for members on the use of alternative flame retardant in all stages of XPS production as reflected in the Output described below.

- o Output 3.2.1 will focus on technical information dissemination on alternatives for the XPS sector is delivered through ISODER's technical support programming for members. This will be done through provision of resources for supply of technical and market references in Turkish and sponsorship of workshop events utilizing recognized international and national experts. The upgrading technical capacity at EPSDER sponsored CEVKAK laboratory related to product testing and certification for qualification of non-HBCD containing product in Output 2.2.2 will also serve the XPS sector.

? *Outcome 3.3 ? Complete phase out of HBCD use in domestic production of XPS (705 t HBCD/year) is achieved:* This Outcome is the second of the two primary project Outcomes that will achieve the project objective, namely the elimination of HBCD use in Turkey, the other being Outcome 2.3 described above. It relates to the investment required in to accomplish replacement of HBCD with suitable alternatives such that the above documented baseline HBCD consumption of 705 t/year is eliminated over a three-year period. The GEF grant allocation to this will be US\$ 565,000 with total net mobilized investment of US\$ 2,755,414 across the six participating enterprises in the sector. The overall investment requirements are based on the documented expenditures of each enterprise for preparation and implementation made in the years 2016-2018, plus detailed cost estimates for additional investment required to complete phase out during the project. The investments involve incremental expenditures supporting HBCD phase out and conversion to environmentally sound alternatives in the general categories of capital equipment and production facility modifications, product development, and testing/technical support costs. These estimates are provided in Table 5 below. The investment made and planned by domestic XPS producers

totals US\$3,320,414 which when deducting the proposed grant, is used for the co-financing stated above for investment mobilized by the enterprises in the sector. It should be noted that in the PIF, the MLF grant (US\$3,650,000) for the elimination of HCFCs in the sector was also included in the indicative co-financing. Given this work was effectively complete in 2016 this is not currently included in the total investment mobilized for the sector. However, the selection of blowing agents is a factor in HBCD alternative selection both for the completed HCFC phase out but also in the future for HFC phaseout where this class of blowing agent is used. Generally, with the exception of one enterprise, mobilized investment levels are more modest than seen for the EPS sector with limited capital investment and mainly product development, and testing/technical support. The amount of investment across enterprises varies widely without direct correlation as to capacity or market share. The overall direct GEF grant cost effectiveness (CE) applicable to participating enterprises is US\$0.80/kg but varies significantly across enterprises with larger producers/HBCD consumers due to economies of scale and differences in production approaches. As in the case of EPS, a final decision on the allocation of the block grant assigned to this Outcome between the enterprises has not been made and will be deferred until the inception phase of project initiation. However, as in the case of EPS producers, analysis undertaken during the PPG stage has evaluated various formula-based distribution methodology options including i) simple equal distribution between enterprises; ii) based on HBCD consumption eliminated; iii) proportional allocation based in total investment, and iv) proportional investment based on future estimated investment. Ultimately, the methodology selected will be based on collective input from all the relevant stakeholders in the proposal review process considering the appropriate balance between achievement of GEB and the need to balance disparity between enterprises in size and basic technical capacity to ensure no competitive inequities are introduced.

Table 5: Incremental HBCD Elimination Investment undertaken (2016-18) and estimated in future in the XPS Sector

Enterprise	Cost Category	Phaseout Investment 2016-18* (US\$)	Future Estimated Phase Out Investment (US\$)	Total Estimated Phaseout Investment US\$)
Wallboard	Capital Investment	-	-	-
	Product Dev. Trials	100,386	33,310	133,696
	Testing/Tech. Support	-	24,727	24,727
	Enterprise Total	100,386	58,037	158,423
EYRAP	Capital Investment	0		-
	Product Dev. Trials	44,300	40,000	84,300
	Testing/Tech. Support	8,700	17,000	25,700
	Enterprise Total	53,000	57,000	110,000

IZOCAM	Capital Investment	3,420	89,774	93,194
	Product Dev. Trials	54,101	177,189	231,290
	Testing/Tech. Support	-	8,550	8,550
	Enterprise Total	57,521	275,513	333,034
ODE	Capital Investment	-	-	-
	Product Dev. Trials	12,300	7,800	20,100
	Testing/Tech. Support	1,200	1,750	2,950
	Enterprise Total	13,500	9,550	23,050
DINAMIK	Capital Investment		9760	9,760
	Product Dev. Trials	38,025	88,725	126,750
	Testing/Tech. Support	-	4,450	4,450
	Enterprise Total	38,025	102,935	140,960
BTM	Capital Investment	200,673	101,357	302,030
	Product Dev. Trials	1,365,703	743,238	2,108,941
	Testing/Tech. Support	39,965	104,011	143,976
	Enterprise Total	1,606,341	948,606	2,554,947
Total		1,868,773	1,451,641	3,320,414

33. Component 4 ? Monitoring and Evaluation: This component supports the monitoring and evaluation in addition to knowledge management inherent in GEF project implementation through Outcome 4.1 where the operational project outcomes and outputs described above are assessed and lessons learnt disseminated for sustainable replication and project indicators are reviewed/evaluated through mid-term review (PEE) and terminal evaluation (UNIDO) steps as detailed in Annex A. It is financed with US\$150,000 in GEF funds and US\$580,000 in co-financing.

#### 4) Alignment with GEF focal area and/or Impact Program strategies

34. The project falls within the GEF-7 Chemicals and Wastes focal area and associated strategy and within that under Chemicals and Wastes Industrial Chemicals Program (CW 1-1) which aims at strengthening sound management of industrial chemicals, and their wastes through better control and reduction and/or elimination. It will allow Turkey to eliminate the use of a POPs listed in Annex A of the Stockholm Convention thus supporting the country's compliance with its obligations under this international agreement. This will be accomplished by introducing the application of internationally competitive technologies, techniques and approaches for eliminating HBCD in processes and products, namely EPS and XPS foam insulation. These sectors are important to the country in ensuring public safety through using fire resistant building materials and achieving increased energy efficiency in buildings and infrastructure generally.

35. Specific to the GEF -7 Programming strategy for chemicals and waste and the investment framework it provides, the project serves to: i) eliminate/restrict/control emissions of a chemical listed in Annex A of the SC; ii) is based on private sector engagement and facilitation of public-private sector investments; iii) contributes to Sustainable Development Goals (SDG) targets linked to SDG?s objectives respecting sustainable production and consumption through in detoxifying their products and materials supply chains to prevent toxic loading of the environment;

#### **5) Incremental/additional cost reasoning and expected contributions from the baseline, GEFTF, LDCF, SCCF, and co-financing**

36. GEFTF contributions are all applied directly to incremental cost associated to the project. The largest portion of this is directed to private sector beneficiaries (\$2,550,000 or 80% of the proposed GEF funding) and consisting of US\$2,100,000 in investment support and US\$450,000 in TA. US\$350,000 in GEFTF resources allocated to Component 1 is for institutional TA directly addressing HBCD elimination with MoEU and associated agencies being the beneficiary. Remaining GEFTF funding is directed to monitoring and evaluation and project management costs consistent with GEF policies. The overall grant cost effectiveness defined in terms of the annual elimination of Consumption is calculated as US\$1.66/kg or if expressed in terms of foam product produced is US\$6.13/t. Cost effectiveness for direct grant support for enterprises in terms of annual elimination of HBCD is US\$1.57/kg for the EPS sector and US\$0.80/kg for the XPS sector.

37. The majority of co-financing (US\$14,941,255) is mobilized investment from the private sector enterprise beneficiaries in EPS and XPS sector that is directly associated with elimination of HBCD and its replacement with environmentally sound alternatives. Additional in-kind funding is also committed by the EPS and XPS a small amount of mobilized investment is provided by the EPS and XPS enterprises and the two industry associations, all associated with supporting the members of the two sectors in addressing HBCD phase out. A significant additional contribution to co-financing is the in-kind recurrent cost contributions from MoEU, Ministry of Industry and Technology, and Turkish Standards Institute amounting to US\$5,331,499 which supports the regulatory and capacity building aspects of implementation of HBCD elimination inclusive of integrating the project with broader national programs and several parallel international projects related to chemicals management and pollution control. In this, MoEU in-kind recurrent cost co-financing of US\$1,000,000 is associated with monitoring and evaluation, and project management cost. The related international projects funded by the European Commission add US\$5,807,200 to overall co-financing. Finally, UNIDO is providing US\$180,000 split between grant and in-kind co-financing in support of the project for monitoring and evaluation. Total co-financing is US\$26,259, 954 which based on the proposed grant gives a grant co-financing ratio of 8.2.

#### **6) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)**

38. The direct global environmental benefits coming directly from the project are the elimination of 1,919 t/year of HBCD consumption based on the average consumption in 2016 through 2018 in each of

the EPS (975 t/yr. ? Table 2 ) and XPS sector (705 t/year ? Table 3) plus an estimated 240 t/year of HBCD imported in pre-blended PS and used directly by final EPS product producers. This involves an estimated 521,000 t/year of foam product from both sectors based on 2018 production from participating enterprises (Tables 2 and 3). Applying these consumption levels, the projected total amount of HBCD use avoided in a period between 2019 and 2022 when the country could potentially still utilize HBCD under its exemption would be 7,436 t. Based on 2018 production rates for EPS and XPS this would translate into the avoidance of an estimated 2,083,000 t of HBCD containing waste in the future.

39. While not possible to accurately quantify, indirect longer terms global environmental benefits will be achieved by the project through facilitation of the adoption of policies and practices preventing release through environmentally sound management of HBCD stockpiles that may exist upon phase out and HBCD containing products when they become wastes will be achieved. .

40. An indirect cross focal area global environmental benefit derived from the project is its role in sustaining a strong domestic capability to produce high quality insulation products particularly for buildings and other infrastructure which supports national capability to maximize energy efficiency and reduce GHG emissions. These arise from anticipated higher utilization of modern insulation material which, based on UNIDO research estimates at the PIF stage, are on average 16% more efficient than traditional insulation material. The rate of using such materials are expected to rise and through this increase building energy efficiency. In addition, using lower GWP blowing agents from parallel technology changes in manufacturing processes will have a large contribution to the climate change. However, quantification of the incremental benefits for this is associated with the project not readily calculable given the lack of data on exact quantities in definable applications and the growth in the market, both subject to the evolution of national policies related to promotion of energy efficiency in the construction sector generally. On this basis, there is no GHG benefit or core indicator claimed for the project as any that might directionally exist can not be calculated or monitored with the project's scope.

## **7) Innovativeness, sustainability and potential for scaling up**

### **7a) Inovativeness**

41. This project along with a companion UNIDO GEF-7 project in China are understood to be the first GEF projects to address HBCD elimination in developing countries after its inclusion in the Stockholm Convention. As such it will be a leader in defining and verifying workable solutions for other industrializing developing countries particularly its approach of achieving complete elimination of HBCD consumption within the framework of a GEF project itself. In addition the project design and allocation of both technical capacity building and direct financial support takes into consideration the vulnerability of SME's particularly in the XPS sector

### **7b) Sustainability**

42. Project sustainability in Turkey is supported by both the complete elimination approach consistent with that adopted by major developed countries and emphasis on supporting regulatory capacity for

enforcement of strong controls on import and use of HBCD and HBCD containing product within the country's developing integrated chemicals management approach consistent with SAICM . This will be ensured by the coordinated participation of key national institutional stakeholders, namely MoEU, MoIT, and MoT who are responsible for enforcement and represent major co-financing participants.

43. Technological sustainability will be ensured by promoting and making available the most current alternative FR and associated production technology to EPS and XPS producers, inclusive of looking forward in that decision making to potential future international convention controls on FRs and on associated chemicals such as blowing agents used in the production process. Likewise, technology innovation and optimization in terms of cost-effective technologies will be promoted throughout this project to ensure involvement, information and awareness among the private and public sector, as well as more broadly to civil society stakeholders. Underpinning all of the above will the linkages provided to an already robust certification process consistent with national and international product standards.

44. Economic sustainability will be enhanced by the primary private sector partnership arrangements inherent in the project design. The project's primary beneficiary enterprises will be incentivized by the combination of enforced regulatory requirements being in place to eliminate HBCD use (essentially a condition of remaining in business) and the use of a performance based grant disbursement mechanism where payments are made upon meeting pre-set phaseout milestones verified by independent inspection, with the primary payment milestone being at the end when an enterprises complete elimination of HBCD as confirmed by product analysis.

45. Social sustainability will be ensured by strengthening information disclosure and public participation and by ensuring the access to project outcomes for the general public via websites and social media. In particular, local communities and women groups will be consulted on project activities to ensure that risks and issues associated with legacy HBCDs and their alternatives will be properly addressed and mitigation strategies as dictated by the implementation of gender equality and women's empowerment measures.

#### 7c) Scaling up

46. Direct scaling up of the project is not required in Turkey give the project design approach of complete national phaseout. However, the approach to dealing with HBCD will be transferable to other countries and more generally to other POPs and priority controlled chemicals. This will be a primary focus of UNIDO's knowledge management initiatives globally and an area where UNIDO will be developing like projects in other developing industrialized countries.

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[1]

<http://chm.pops.int/Implementation/NationalImplementationPlans/Guidance/tabid/7730/Default.aspx>

[2] Parties may register for specific exemptions listed in Annex A or B pursuant to paragraph 3 of Article 4. These specific exemptions have a limited time frame and shall expire five (5) years after the date of entry into force of the Convention with respect to that particular chemical (paragraph 4 of

Article 4) unless an earlier date is indicated in the Register by the Party or an extension is granted by the Conference of the Parties under paragraph 7 of Article 4.

[3]

<http://chm.pops.int/Implementation/Exemptions/SpecificExemptions/HexabromocyclododecaneRoSE/tabid/5034/Default.aspx>

[4]

<http://www.pops.int/Implementation/Exemptions/DecisionsRecommendations/tabid/167/Default.aspx>

[5] [http://apps.csb.gov.tr/mevzuat/dosyalar/r\\_20181114095748486\\_61965ef0-e850-4d23-a02b-67db171e9ed6.pdf](http://apps.csb.gov.tr/mevzuat/dosyalar/r_20181114095748486_61965ef0-e850-4d23-a02b-67db171e9ed6.pdf)

[6] EC Regulation No. 2016/293 amending EC Regulation No. 850/2004

[7] The seventh domestic XPS producer is a long-established plant located in Dilovas?, Kocaeli. Up until recently it has been owned and operated by a major multi-national chemical company (DOW).. Based on corporate policy , DOW declined any participation in the project including provision of information on production and historical HBCD consumption, simply indicating it would eliminate HBCD usage using the dominant HBCD polymeric alternative in compliance with national regulations. In 2019 during project preparation this plant was acquired by Ravago who have provided historical HBCD consumption data and confirmed that HBCD was eliminated by the end of 2019..

[8] <https://www.thegef.org/project/enabling-activities-review-and-update-national-implementation-plan-stockholm-convention-2>

[9] [https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/pdf/turkey/ipa/2010/137\\_tr2010.0327.03implementationofpops.pdf](https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/pdf/turkey/ipa/2010/137_tr2010.0327.03implementationofpops.pdf)

[10] <https://www.thegef.org/project/pops-legacy-elimination-and-pops-release-reduction-project>

## **1b. Project Map and Coordinates**

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

Please refer to Annex E.

## **1c. Child Project?**

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

## **2. Stakeholders**

**Select the stakeholders that have participated in consultations during the project identification phase:**



## Civil Society Organizations

## Indigenous Peoples and Local Communities

Private Sector Entities Yes

If none of the above, please explain why:

Please provide the Stakeholder Engagement Plan or equivalent assessment.

?Stakeholder Engagement Plan has been uploaded as Annex K.

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

47. The stakeholders involved and impacted by the HBCD issue and this initiative to address it can be defined at two levels, Primary Stakeholders and Secondary Stakeholders, as described below which in turn informs the approach to stakeholder engagement that has been undertaken to date and will be pursued during its implementation. The following also summarizes the proposed Stakeholder Engagement Plan.

48. Primary Stakeholders: The primary stakeholders will have an active role in its execution and generally cover the main government agencies whose mandates and functional responsibilities cover the two targeted industrial sectors, and the private sector enterprises directly impacted by the need to eliminate HBCD in their production along with the specific collective industrial associations that represent and support them. During the PPG stage, extensive direct consultation and interactive exchange of information and accommodation of specific interests and requirements of these stakeholders has been undertaken in varied forums ranging from workshops, collective and individual meetings, provision of references and contacts on HBCD alternatives, and site visits, inclusive of technical, environmental and social data collection. More specifically these stakeholders are:

- Ministry of Environment and Urbanization*: MOEU is the project's national Executing Agency with overall policy, legislative and regulatory responsibility for chemicals and waste issues, POPs and specifically fulfilment of national obligations under the SC. Within MoEU the Chemicals Department leads this responsibility supported by other Departments and directorates responsible for waste and building materials control (General Directorate of Construction Works). In terms of stakeholder engagement, it will coordinate the communication and oversight of project activities with other stakeholder agencies in government including those within MoEU, and be the overall focal point for external stakeholders identified below including the local communities hosting EPS and XPS plants and participating civil society organizations.

- Ministry of Industry and Technology*: MoIT in addition to supporting the project with co-financing has a major interest in ensuring the application of current and sustainable competitive technology in the important and growing EPS and XPS production sectors, all as part of their mandate for industrial development policy. It has a specific interest in the implementation of the project and distribution of resources from it in a manner that both maintains competitive national capability for the supply of these products for the construction industry but also that this kind of industrial production is equitably distributed across the country consistent with national industrial development policy. It is also

responsible for a key subordinate organization stakeholder, namely the Turkish Standards Institute which is the key provider for technical certification capability applicable to these products.

- *Ministry of Trade*: MoT is a principle stakeholder through its mandate to oversee the General Directorate of Customs who will be a key partner in the project's support for enhanced chemicals import control which is an important element of project sustainability and ensuring both the protection of participating domestic EPS and XPS producers from unfair competition from HBCD containing product and national compliance with its obligations under the SC.

- *Private Sector EPS Pre-Blended PS and XPS Producers*: The four pre-blended PS producers and six participating XPS producers are primary beneficiaries of the project as described above as well as the major source of co-financing through the mobilized investment that they provide. Continuing close coordination on and ensuring the exchange up to date technical, financial and commercial information will be a key element for successful project implementation information

- *EPS/XPS Industrial Associations (ESPDER, ISODER)*: The two industry associations have been significant contributors to project preparation to date as well as in MoEU's extensive industry consultations undertaken in the period leading up to the PPG stage. This will continue with them playing a primary role in delivering collective technical support, partnering with MoEU and UNIDO in national information dissemination, and in stakeholder engagement with supply chain and product customer stakeholders.

50. Secondary Stakeholders: At the next level, the scope of stakeholder engagement involves outreach to various parties who are not directly engaged in project itself but may be directly or indirectly impacted by it and its outcomes and outputs. This level of stakeholder would encompass customers and users of EPS and XPS production supported directly by the project, the supply chain supporting the EPS and XPS sectors, the local communities in which project activities are undertake including their governing institutions, and civil society at both the national and local level with advocacy interests in the project and its impacts including gender issues. During preparation, engagement at this level of stakeholder has been initiated in the PPG stage though information on the project design being conveyed through the two industry associations to both supply chain stakeholders and end users of EPS pre-blended EPS and XPS. Likewise, at both a national and local level consultation with advocacy groups has been undertaken in the course of the ESMP and Gender Assessment study work undertaken as part of the PPG stage. This would be expanded with information programs and consultation for local community and civil society stakeholders beginning in the inception phase of project implementation. Specific civil society organizations that have been identified and will be involved include the Chemical Industry Association of Turkey, the Chemical/Petroleum/Rubber /Plastics Industry Employers Union of Turkey, representative gender advocacy groups, labour organizations, academic experts, ENGO's expressing interest, and local governments in affected communities.

49. Stakeholder Engagement Plan: The Stakeholder Engagement Plan developed during the PPG stage is provided in Annex K, noting that this plan will be updated as additional stakeholders may be identified as part of the project work plan developed during the inception phase of project implementation. The essential elements of this plan are provided for in all components, particularly within the scope of Component 1 and more specifically in: i) Outcome 1.1 where broadly based dissemination of information on current alternative FR technology and production techniques will be broadly disseminated both to private and public sector stakeholders utilizing international experts; and ii) Outcome 1.2 where under MoEU's auspices the consultation and information will be undertaken to a broader range of stakeholders including communities where EPS and XPS production occurs where local governments, civil society and the general public will be engaged. It is planned to initiate this community level engagement during the inception stage of implementation with periodic follow up updates on project progress. This will include presentation, and solicitation of feedback on results of the environmental, social and gender assessment work undertaken during the PPG. Included in the

scope of the stakeholder engagement plan would also be the direct TA related consultation and information dissemination that is undertaken under the auspices of the two industry associations in Outcomes 2.2 and 3.2 described above noting that information dissemination related will extend to various parts of the supply chain supporting the two sectors, particularly chemicals importers and distributors, and to customers of the products from these sectors.

**Select what role civil society will play in the project:**

**Consulted only; Yes**

**Member of Advisory Body; Contractor;**

**Co-financier;**

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

**Executor or co-executor;**

**Other (Please explain)**

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

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

50. During the PPG stage the UNIDO Country Office undertook a Gender Analysis Study which has been reviewed and cleared under UNIDO Policy on Gender Equility and Empowerment of Women and is provided in Annex H. Utilizing the required UNIDO Gender Compliance and Marker form the project has been categorized as Gender Marker 1 - ?Limited expected contribution to gender equality? with specific markers identified as satisfied being: i) A gender analysis of the project has been conducted; ii) Findings from this gender analysis have informed the design of the project: and iii) Data and indicators are disaggregated by sex where applicable. Overall this gender work demonstrates the substantial progress Turkey has made as a country over the last two decades respecting virtually all indicators related to gender equality and likewise documents the project specific plans for expanded awareness and promotion of these principles during the project?s implementation. This will be achieved by integration of gender issues into the project design through inclusion of gender related modules in the overall awareness activities defined in the relevant Outcomes and Outputs of the three main project components. Likewise, gender marker monitoring is to be included in the scope of project monitoring and verification activities under Component 4 and in the scope of project management and supervision undertaken by the MoEU as Executing Agency through the Project Management Unit responsible for project implementation with UNIDO support as required. In support of supervision and awareness activities, the PPG team has provided estimates for women impacted by and participating in

the project in a disaggregated form which are reflected in the Core Indicators section (Core Indicator 11) of this document and in the Project Logical Framework (Annex A). This data in summary is included in Table 6 below. As an overall summary of these estimates, it can be concluded that in many respects the existing baseline applicable to the project at the Implementing Agency, Executing Agency, project management level and among participating stakeholder Institution show a high level of women's participation with an expectation during project implementation of full gender equity. At the beneficiary enterprise level baseline participation of women is generally low being 27% at the management and professional level and less than 3% in the high employment production operations level. Aspirational implementation targets in among enterprises are set at being increased to 30% and 7% at these two levels respectively. At the enterprises level core participation of women in professional and technical roles including laboratories is noted and potential exist for expansion of participation in these roles as well as management. With respect to the latter it is noted that in the case of one of the major beneficiaries in the EPS sector the Managing Director is a woman of high technical standing and influence in the business, something that represents an example for replication. With respect to participation in actual production operations, the Gender Assessment Study identifies the widely held perception among women that industrial operations involving controlled chemicals such as POPs as being perceived as particularly risky to women and represents a principle barrier to women's employment at this level. As is discussed in the ESMP study discussed in Section 5 below and Annex I, workplace health and safety risks and environmental risks generally are low and what do exist will be substantially mitigated with enforcement of existing national regulations and standards, something the project will promote and monitor.

Table 6: Gender Baseline Data and Implementation Targets

Project Area	PPG Baseline				Implementation Target			
	Women	Men	Total	% Women	Women	Men	Total	% Women
<b>Project Oversight/Management</b>								
UNIDO	2	2	4	50%	3	3	6	50%
Project Management	3	1	4	75%	5	3	8	50%
<b>Institutional Oversight</b>								
a) MoEU	5	2	7	71%	10	10	20	50%
b) Institutional Stakeholders	7	0	7	100%	5	5	10	50%
<b>EPS and XPS Sectors</b>								
a) Industrial Associations	2	3	5	40%	3	3	6	50%
b) EPS Sector Enterprises								
Total Employment	21	395	416	5%	31	399	430	7%

Management/Professional Positions	21	66	87	24%	25	70	95	26%
Production Operations	0	329	329	0%	16	329	345	5%
<b>e) XPS Sector Enterprises</b>								
Total Employment	91	676	767	12%	125	704	829	16%
Management/Professional Positions	68	175	243	28%	75	180	255	30%
Production Operations	23	501	524	4%	50	524	574	11%
<b>Project Totals</b>	131	1079	1210	11%	182	1127	1309	14%

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

Yes

**Closing gender gaps in access to and control over natural resources;** No

**Improving women's participation and decision making** Yes

**Generating socio-economic benefits or services or women**

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

Yes

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

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

51. The foundation of the project by its nature is based on a very high level of private sector engagement with the primary project GEF grant beneficiaries being private sector enterprises in the EPS and XPS sectors. These enterprises are the main drivers for the project's objective and underpin the government's policy and general institutional commitment to the project. They provide the substantial amount of mobilized investment that constitutes a major part of project co-financing. In addition, the respective associations of the individual enterprises will provide for extensive engagement of the large body of private sector stakeholders in the two sector's supply chain and support the engagement of their customers, particularly EPS end product producers and XPS customers in the construction industry. In this regard, the Stakeholder Engagement Plan (Section 2 above and Annex K) is substantively based on private sector engagement at both the national and local levels through beneficiary private sector enterprise and industry associations direct involvement with the PEE in project oversight and in outreach to the secondary stakeholders in the extended private sector entities affected, local governments and broader civil society.

52. The intervention model to engage the private sector and encourage investment that is the basis for the project's origin and design is based on transforming policy and regulatory environments to encourage sustainable business investment as illustrated by the project's originating stimulus being the coverage of a POPs FR (HBCD) by the SC, followed by proactive action by Turkey's government to control and set targets for its elimination which itself was supported and facilitated by a positive response for GEF funding, all of which is stimulating timely private sector investment. The parallel institutional capacity building underpins that investment by ensuring the delivery of a level regulatory playing field in which these investments can be made.

**5. Risks to Achieving Project Objectives**

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

53. Overall the risks associated with this project are considered low at the stage of starting implementation, given the substantive proactive work done by both the Government and private sector. The following provides an updated tabular summary covering identified risks, their rating and an analysis of mitigation actions proposed as reflected in the project design and implementation approach described in this document.

Risks	Level		Mitigation measures
	Likelihood	Impact	

<p>Inability to access all the necessary information related to the recent and current use of HBCD in the country.</p>	<p>Low</p>	<p>Low</p>	<p>The collection of comprehensive information on recent and current consumption of HBCD and on action being taken on its replacement accomplished during the PPG stage have substantially mitigated this risk both with respect to occurrence and impact at this stage of project development. With the proactive advance intervention by MoEU in engaging the private sector in both the EPS and XPS sectors and the transparent efforts of the two industry associations, a high confidence level exist in the identification of substantially all users of HBCD in these sectors and, with one expectation, obtaining their participation up to and including documented materials and official commitments to substantial investment mobilization. The one exception is an enterprise where technical information remains controlled by a multi-national company that declined project participation but who is undertaking replacement of HBCD using its own means and a preferred alternative technology that it holds patents on.</p>
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<p>Absence of accessibility to technically acceptable and cost-effective alternatives to HBCD in these sectors and lack of availability of information on such alternatives necessary to support the technical capacity support the project will be provided collectively and individually</p>	<p>Low</p>	<p>Medium</p>	<p>Research undertaken as referenced in the baseline material and documentation disseminated during the PPG stage indicates that there are now commercially available HBCD alternatives in adequate quantities from a number of competing international suppliers represented in Turkey. These are now widely applied in OECD countries that formally were largest consumers of HBCD globally and whose enterprises continue to participate competitively in global markets for EPS and XPS products. This supply base involving large multi-national chemical suppliers has a critical commercial mass that would support continued growth as HBCD consumption is phased out globally. This is anticipated to further develop both in capacity and increased cost effectiveness with continued development work by global suppliers, not the least of which is the expectation of significant participation by China in the alternative market, something that is supported by the parallel GEF/UNIDO project in China that focuses on having such capacity in place by 2021. Turkey as major industrial chemicals market has a robust private sector chemical import and distribution commercial sector that can be anticipated to respond competitively where enterprises are not able to access alternatives directly. While the likelihood of this risk is considered low based on the above a medium risk is assigned recognizing that one or more of smaller enterprises, particularly in the XPS sector might lack the inherent technical capacity and means to adapt to HBCD alternatives even if available, notwithstanding technical support provided.</p>
<p>Low replication of lessons learnt from project conversion activities at both the national and the international level.</p>	<p>Low</p>	<p>Low</p>	<p>The national replication risks originally identified have been effectively eliminated by the re-design of the project to encompass elimination of all identified HBCD consumption in the EPS and XPS sectors. In the event that other smaller consumers should appear during the project's implementation these will be included in the TA Outcomes and MoEU is committed to enforce the ultimate ban on use. Internationally, the lessons learned from the project will be publicized in relevant websites (Stockholm Convention site, GEF agencies, etc.) and forums, involving the beneficiaries and the Turkish government for effective dissemination.</p>



<p>Insufficient number of companies showing interest in the TA activities provided under Outcomes 1.1, 2.1, 2.2, 3.1 and 3.2.</p>	<p>Low</p>	<p>Low</p>	<p>The comprehensive collective and individual consultations with all major participants during the PPG stage has provided a strong interest and demand for the kind of technical support offered by the project including an emphasis on such support being provided individually at an operational level, particularly by small enterprises. Continued direct consultation during implementation, particularly during the inception stage will serve to maintain this interest and commitment.</p>
<p>Reluctance by companies to undertake a conversion to HBCD alternatives</p>	<p>Low</p>	<p>Low</p>	<p>The level of consultation particularly related to the project's significance and the regulatory drivers that are now in place that has occurred to this point have effectively addressed any initial reluctance by enterprises in undertaking the required conversions. The timely approval and initiation of implementation activities, particular the TA components will serve to sustain this and further minimize the risk. During implementation the project will regularly monitor conversion work plans to ensure it is sustained. At this point any reluctance by companies is limited to smaller companies, particularly in the XPS sector largely due to limited technical capacity which is being addressed by the project. In any event the failure of such companies to eliminate HBCD would have minimal impact on actual project outcomes given their limited consumption and the probable outcome in that case of leaving the business.</p>
<p>Failure of regulatory controls in place and to be implemented to effectively control illegal imports of HBCD and competing products containing HBCD thus undermining the viability of domestic enterprises using environmentally sound alternatives and potentially stimulating reversion to HBCD use.</p>	<p>Low</p>	<p>Medium</p>	<p>The proactive approach to date of putting in place the regulatory framework under the POPs regulation banning the use and import of HBCD and HBCD containing products provides the legal foundation for strong enforcement that addresses this. The significant policy and financial commitment across the main responsible institutions for chemicals management and its harmonization with international chemicals management and trade practice serves to support realization of effective regulatory controls required to sustain the elimination of HBCD. This is further enhanced by capacity building and focusing the regulatory inspection mandate of the General Directorate for Construction and General Directorate of Customs on the HBCD issue at import and application stages through updating HS Codes and market surveillance.</p>

<p>The transition and ultimate elimination of HBCD will have adverse environmental impacts at a local level.</p>	<p>Low</p>	<p>Low</p>	<p>Albeit low, the principal direct environmental risks currently identified with the use of HBCD, both in terms of likelihood and impact are workplace exposure to it, its releases of the chemical to air, water and soil during the production process, and potential for release HBCD from waste at end of life for products containing it. The replacement of HBCD with alternatives having less environmental or workplace, health risk is essentially positive in terms of risk reduction. However, the project Environmental and Social Management Plan (ESMP) developed during the PPG process (Annex I) makes provision for the evaluation and upgrading as required of enterprise operational practices to minimize any such releases consistent with national regulations. In the case of waste issues, the project itself in Component 1 supports national strategy development to address HBCD containing wastes as part of a broader national program to address priority chemicals containing waste. Specific environmental risks and their mitigation are addressed in the ESMP contained in Annex I.</p>
<p>Adverse socio-economic impacts could result from the aggressive elimination of HBCD in the EPS and XPS</p>	<p>Low</p>	<p>Medium</p>	<p>Potential socio-economic impacts could result in the event that enterprises were forced out of these particular sectors with resultant negative local employment and economic impacts. At a national level this could result in either a shortage of critical products, particularly for the construction sector and/or market shifts to imported products with resultant impacts on the national balance of payments. The demonstrated economic and business strength of both sectors generally serves to minimize this risk, qualified by there being some higher risk to smaller, less technically capable enterprises. Additionally, these potential impacts will be monitored both by the government stakeholders and project implementation team and the project implementation strategy will retain the flexibility to respond as required. The ESMP in Annex I further elaborates this risk area. Gender related issues are addressed separately in the gender Assessment Study (Annex H and Section 3 above.</p>
<p>Climate Change Risk</p>	<p>Low</p>	<p>Low</p>	<p>There are no direct climate change risks such as storms, floods and drought that are currently identified as applying to activities or facilities associated to the project. The STAP guidance on climate risk screening has been considered.</p>

## COVID-19 Related Risks and Potential Opportunities

There are certain risks related to the current pandemic that could have an impact in the implementation of the project. These have been grouped in three main categories:

- Project delivery modality: If the restrictions related to the current pandemic continue in the coming months, there will be a constrain impact regarding the actual project delivery modality which is planned around face-to-face interaction and international experts that would need to travel, particularly in the early implementation stage. A certain number of meetings have been planned under the main outcomes and outputs between enterprises, institutional/civil society and other stakeholders. If the situation continues, during the inception phase several adjustments will be made in the project scope related to technical capacity building, technology transfer and awareness raising events that initially contemplated face-to-face interaction in the form of workshops and in-plant technical advice assistance. The scope will be shifted towards web-based conferencing and interactive virtual platforms and tools, particularly in the case of resource people (i.e. international experts) is restricted and whenever COVID-19 protection and mitigation measures are not feasible (masks, social distancing, etc.).
  
- Supply chain and enterprise financial viability: Some potential risks related to the supply chain and enterprise financial viability could arise in light of the pandemic.

These risks have been identified and if necessary they will be addressed and mitigated. There are low risks associated with the supply chain disruptions on the required replacement chemical supplies and consumables (since imported capital equipment requirements with technical support are minimal). However, these risks are mitigated by the relatively advanced state of conversion in place as well as the maintenance of commercial supply chains, particularly with the European Union during the pandemic. Overall, this should be manageable at the enterprise level and it is not likely to affect the project in a significant manner.

The possible slowdown on the economic activity should be considered as a risk that could impact enterprises and their financial viability. At the inception stage, the country project executing entity (Ministry/PMU) need to assess the current situation regarding production and sales of the sector as well as the financial status before the final commitments to individual enterprises is made. Currently, the situation has been analysed and , manufacturers in Turkey have been producing for both the domestic and the foreign market. In the internal market, the construction industry has been heavily affected by the COVID-19 pandemic and it has decreased in general terms. However, European countries have shifted to manufacturers from Turkey instead of manufacturers in the East due to transportation problems. The fall in petroleum also had an impact on the increase of market demand. All these circumstances have led to a growth on the production of EPS pre-blended enterprises. On another side, the demand for single-use plastics have increased. Since flame retardants are not generally used in this type of materials, this has resulted in an overall increase in the EPS sector that produces GPPS.

- Potential cluster infection outbreaks in the manufacturing workplaces: One risk that could have the most significant implication is the impact of potential cluster infection outbreaks in the enterprise manufacturing workplaces and it is important to consider how the project can support mitigation and respond to the impacts on the implementation if this situation occurs. At the project inception phase, an assessment should be made regarding the potential for cluster outbreaks in the individual industrial settings at each beneficiary enterprise inclusive of providing and assessing COVID-19 mitigation plans that are consistent with the national and WHO public health guidance.

## **6. Institutional Arrangement and Coordination**

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

54. UNIDO will be the GEF Implementing Agency (IA) for the project bringing its global experience on XPS and foam sectors in general and with it the ability to facilitate access to companies within these sectors both nationally and internationally in terms of technical developments and approaches to HBCD phase out. UNIDO's leadership as the IA to the parallel GEF HBCD phase out project in China is a key example of this noting that the projects in Turkey and China represent GEF's flagship interventions in the elimination of HBCD. The project's execution will be undertaken through a contractual arrangement between UNIDO and MoEU, the Project Executing Entity (PEE). The MoEU will deal directly with the private sector participants (individual enterprises and industry associations).

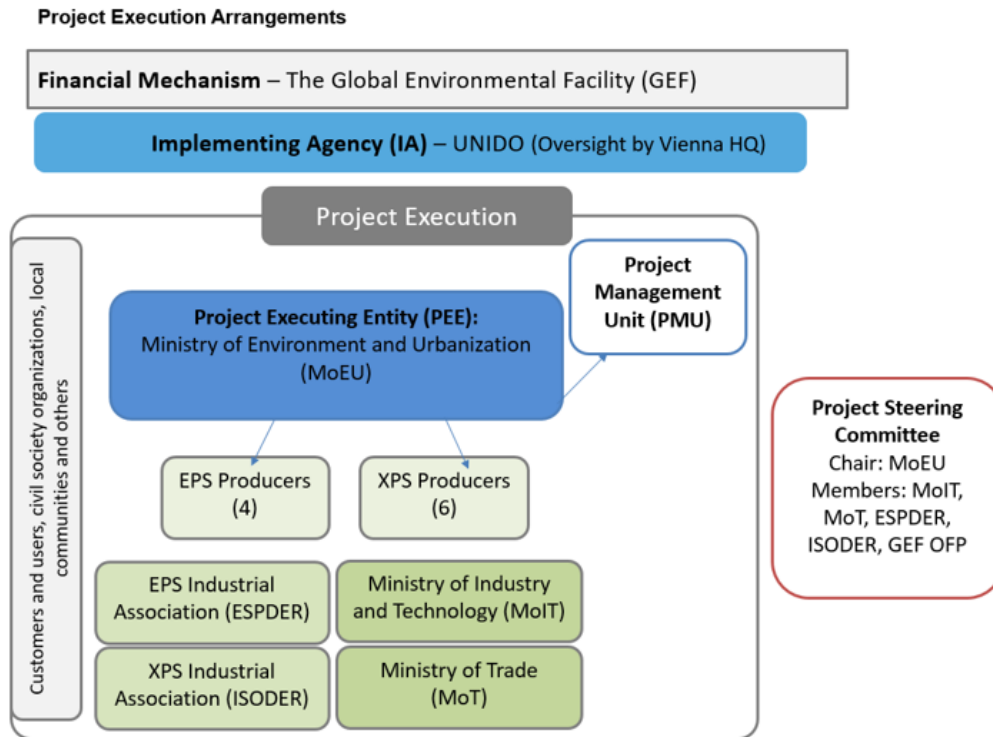
55. The Ministry of Environment and Urbanization, as the administrative and regulatory authority for environmental protection, is the core regulatory agency for all chemicals management, POPs, and waste management related activities in the country. As such they are mandated to act as the national Project Executing Entity (PEE) for this project and will assume overall executing responsibility. In that capacity they will chair and provide staff support for the Project Steering Committee (PSC) established to oversee the project. They will work closely and coordinate with other institutional stakeholders, particularly the Ministry of Industry and Technology, and Ministry of Trade both of whom will be represented on the PSC.

56. The PSC will function as the main project oversight mechanism. It will meet regularly to review reporting on project progress and be the approval body for major project decisions related to overall scope of work programs, budgets and other issues of policy impacting the project's implementation. In addition to the above noted main institutional stakeholders, membership will be extended to EPSDER and ISODER. Additionally, the GEF Operational Focal Point will be invited to participate in the Project Steering Committee.

57. Day to day supervision and administration of the project will be undertaken by a dedicated Project Management Unit (PMU) set up by the MoEU and located in its premises and specifically the Chemicals Department acting its project executing role. The PMU will be supported by the MoEU based on the project management costs included in the GEF Grant. It will be staffed with appropriate national technical and project management expertise including as necessary procurement and grant disbursement

administration functions as required. This will be supplemented by national and international experts as identified and contracted.

58. The figure below provides a project implementation organization chart.



59. The PMU working with MoEU, MoIT and MoT will coordinate and cooperate with a number of other relevant GEF-financed projects and other initiatives with the common purpose of ensuring integration of their individual efforts for common benefits and lasting results. The following lists such GEF projects and other initiatives and notes aspects of coordination:

- *Improvement of the environmental performance of the foam sector: Phase out and management of hexabromocyclododecane (HBCD) in China (GEF-UNIDO)* ? This is the parallel HBCD project in the GEF portfolio. Coordination will be undertaken through UNIDO to exchange information on approaches and results, particularly with respect to alternative development, production phase out schedules and general consistency. This coordination has been initiated during the PPG stage and will continue with direct contact arrangements at the PMU and enterprise level during implementation.
- *POPs Legacy Elimination and POPs Release Reduction Project (GEF -UNDP/UNIDO)*. This large, completing project has successfully eliminated substantial POPs stockpiles (PCBs, POPs pesticides) in Turkey, developed/demonstrated environmental sound treatment and destruction infrastructure for POPs waste and abatement of POPs releases, and initiated systematic addressing of contaminated sites. It contains lessons learned in the implementation of a similar significant POPs release project and specifically in creating enhanced technical capability for national project management and capability in managing POPs stockpiles and POPs wastes that can be utilized by this project.
- *Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (GEF-UNIDO)*. This project while now complete has been a foundation initiative and informs the project respecting further NIP updates for latter and potential future SC amendments, particularly in respect to ensuring that alternatives to HBCD adopted themselves will not potentially in the future be controlled under the SC thus creating a future liability under the SC to both the country and potentially the GEF.

•*Improvement of the environmental performance of the foam sector: Phase out and management of hexabromocyclododecane (HBCD) in China.* The upcoming project in China will be implemented in close coordination with the project in Turkey throughout the full duration and beyond project completion of both initiatives. Project team conference calls will be organized yearly and cross-participation in the technical capacity building and awareness raising activities will be explored to build synergies among both projects. Particularly, the work developed under the project in China regarding the production of HBCD alternatives could be a useful experience for the initiative in Turkey.

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•Ownership of the equipment to be purchased by the project budget by PEE

60. Assets procured under the Agreement between UNIDO and PEE funded from the GEF shall be under the ownership of PEE until such time an asset is transferred to the final recipient. PEE shall coordinate with UNIDO on when the asset is transferred and shall provide a comprehensive inventory list of all assets procured and thereafter transferred.

#### **7. Consistency with National Priorities**

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

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

61. The project is consistent with the Turkey's updated National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants which covers and prioritizes elimination of HBCD as a priority. More broadly it is aligned with national policies in the area of industrial and economic development by ensuring Turkish manufacturers are utilizing best available techniques and technology such that this key industrial sector is competitive and export ready. More specifically, it will contribute to the National Development Plan (NDP) of Turkey with the National Waste Management Strategy and the National Action and Implementation Plan.

#### **8. Knowledge Management**

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

62. Knowledge management is a central piece in this initiative, which will be mainstreamed through the TA activities related to i) the information assembled on available alternatives in each sector, ii) their application in each sector at a practical level and iii) the utilization of the private public partnership approach being utilized to achieve this. This was initiated during the PPG stage with the compiling and assessment of detailed information on the current use of HBCD as documented herein as well as dissemination of reference documentation and contacts on alternatives.

63. This knowledge base will serve as a starting point for broad dissemination efforts undertaken by UNIDO beginning in the implementation inception phase which will involve project information being shared with national and international institutions on a regular basis throughout project implementation. The Project Executing Entity will establish a website to compile and disseminate the information gathered

as well as the results and the experiences of the project. The information will also be used as the basis for the related awareness activities: training and information sessions, as well as publicity in websites of companies and the government, among other activities that have been detailed above. After completion of enterprise specific HBCD elimination the corresponding lessons learnt will be shared with relevant stakeholders at the national and international level through the same channels.

64. UNIDO's experience on the development and implementation of similar initiatives and programs, will ensure an effective flow of information among the stakeholders and, consequently, a greater impact in Turkey and wider in the region and globally. Considering that this project is the one of the first of its kind for GEF financing, the project will put a special emphasis on lessons learnt and their dissemination in the global community. UNIDO will be also implementing a GEF project (GEF 10163) ? Improvement of the environmental performance of the foam sector: Phase out and management of hexabromocyclododecane (HBCD) in China? where close coordination will be undertaken, with future projects that maybe developed with relevant countries. Knowledge sharing through different common platforms (common trainings, conferences, discussion/consultative groups, etc) and cross participation in capacity building will be promoted.

## **9. Monitoring and Evaluation**

### **Describe the budgeted M and E plan**

65. Monitoring and Evaluation (M&E) of the project implementation is one of the key elements taken into account in the project design phase. The M&E of the project activities, outputs and outcomes will be carried out in order to track the achievement of its targets and project performance. It will also contribute to the corrective measures that will identify and correct issues and/or problems if any. The results of the M&E will be additionally used to improve the project activities and cope with any changes that might take place in the project environment.

66. The M&E of the project will be conducted in accordance with the established UNIDO and GEF procedures. Monitoring will be based on the indicators defined in the results logical framework (which also details the means of verification) and the annual work plans.

67. UNIDO as the Implementing Agency (IA) will involve the GEF Operational Focal Point (OFP) and relevant project stakeholders at all stages of the project monitoring and evaluation activities in order to ensure the use of the evaluation results for further planning and implementation.

### Monitoring

68. The project monitoring will be responsibility of the PMU set up by MoEU as Project Executing Entity (PEE). During the inception phase, the PMU in collaboration with project partners will develop a detailed monitoring plan that will be updated at least once annually. The monitoring plan will include but not limited to the tracking of progress, performance and accomplishments related to:

- - ? Implementation of project activities;

- ? Effectiveness of awareness raising and capacity building programme including their impacts and usefulness;
  - ? Initiatives of project partners to support the elimination of HBDC;
  - ? Regulatory framework enforcement impact;
  - ? Measures on the environmental sound management on the HBDC containing waste;
  - ? Effectiveness and usefulness of the materials disseminations;
  - ? Mobilization of indirect stakeholders;
  - ? Environmental and Social Management Plan;
- and
- ? Gender proposed indicators at output level.

#### Reporting

69. Deliverables: i) official announcement of the project steering committee, ii) copies of posted job descriptions, iii) copies of contracts, iv) copies of work plans, v) meeting minutes, vi) copies of proposed agenda, list and meeting minutes of the project steering committee members, vii) progress reports and deliverables highlighting any possible delay and preempting the issues that could impact in the implementation of the project, and viii) other requested documents.

#### Evaluation

70. The project will be reviewed at the mid-term and evaluated at completion (called Mid-Term Review and Terminal Evaluation respectively). The project terminal evaluation will be carried out following the Evaluation Guidelines of UNIDO and in line with the Evaluation Policy of the GEF.

71. The deliverables are i) itineraries of evaluators, ii) copies of meeting minutes, iii) data collected for the evaluations, iv) copies of the mid-term review and the terminal evaluation reports.

72. The mid-term review (MTR) will be carried out in the second year of the project implementation. The objectives of the mid-term review are to review the progress of each project activities and to assess effectiveness of implementation according to the project's indicators presented in the project results framework. The findings from mid-term review could propose recommendations and remedial actions to be incorporated as improvement in the implementation strategy and executing for the remainder of the project's duration, if necessary. The term of reference for the mid-term review will be prepared by the PEE in accordance with the generic TORs developed by the UNIDO Independent Evaluation Division. The mid-term review report will be cleared by UNIDO and approved by the PSC.

73. Meeting records and monitoring reports will be used to keep Government officials and stakeholders up to date, engaged and benefitting from participation in the project and/or the Project Steering Committee.



The Project Steering Committee will review the latest activities, endorse planned activities and provide meeting minutes signed by the Secretary to UNIDO.

74. During the project implementation, the project implementation reports (PIRs) will be prepared to monitor the progress achieved since the start of the project or previous reporting periods.

75. The terminal evaluation (TE) will start within six months after the project implementation has been completed and at least two months before the project termination. The final evaluation will look at the impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefit goals. Since the sustainability of results will be one of the key evaluation topics, the effectiveness of capacity building program, the dissemination and usage of lessons learned, and the replicability of project results will be focused. The terms of reference (TOR) for the final evaluation will be prepared by UNIDO in accordance with the generic TORs developed by the Independent Evaluation Division.

76. Note: The budget numbers allocated to this area in the Project framework are US\$150,000 GEF grant and US\$580,000 co-financing. The assumption is the co-financing involves US\$180,000 from UNIDO of which US\$80,000 is grant and US\$100,000 in-kind, with the MoEU in-kind contribution in addition. The budgeted activities would typically cover the mid-term review activities as well as the terminal evaluation.

### Budgeting

The budget estimation for the M&E activities is shown in the table below.

<b>Type of M&amp;E activity</b>	<b>Participants</b>	<b>Budget in USD (excluding PMU staff time)</b>	<b>Time frame</b>
Project inception workshop and report	PEE	16,000	Within first three months after the 1 <sup>st</sup> PSC meeting
Monitoring and verification of project progress and performance	PEE	81,000	In line with the annual project monitoring and evaluation plan that will be prepared by the PMU in consultation with project partners
Project reports	PEE	12,000	Annual report and project terminal report
External Mid-Term Review	PEE	16,000	Mid-point of project implementation
Independent final evaluation (external)	UNIDO	25,000	Within 6 months after the Project implementation completed and two months before project termination
Total indicative cost		150,000	

## Legal Context

77. ?The Government of the Republic of Turkey agrees to apply to the present project, mutatis mutandis, the provisions of the Revised Standard Technical Assistance Agreement concluded between the United Nations and the Specialized Agencies and the Government on 21 October 1965.?

## **10. Benefits**

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

78. The principle socio-economic benefit derived from this project is that two important industrial sectors will be sustained and potentially expand with associated national and local economic and employment benefits when otherwise the application of the obligations from a global chemical convention banning the use of HBCD would significantly reduce its prospects, particularly among smaller enterprises. Linked to sustaining these industrial sectors are the expectation of the country being able to produce critical insulation building materials that both allow maintaining world class energy efficient building design as well as a high level of public safety protection through fire protection capability. These socio-economic benefits are directly linked to the principal global environment benefit from the project, namely the elimination of HBCD, an Annex A POP under the SC, in one of the largest consumers among developing countries.

## **11. Environmental and Social Safeguard (ESS) Risks**

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

**Overall Project/Program Risk Classification \***

<b>PIF</b>	<b>CEO Endorsement/Approva I</b>	<b>MTR</b>	<b>TE</b>
<b>Medium/Moderate</b>			
<b>Measures to address identified risks and impacts</b>			

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

<b>E&amp;S risks identified during PPG Stage (Full description above)</b>	<b>Mitigating Measure</b>	<b>Technical details of the mitigation technology, process, equipment, design and operating procedures</b>	<b>Location</b>	<b>Timeline, including frequency, start and end date</b>	<b>Responsibility</b>	<b>Cost of Mitigation (If Substantial; to be covered by the GEF grant or non-UNIDO co-financing)</b>
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E&S risks identified during PPG Stage (Full description above)	Mitigating Measure	Technical details of the mitigation technology, process, equipment, design and operating procedures	Location	Timeline, including frequency, start and end date	Responsibility	Cost of Mitigation (If Substantial; to be covered by the GEF grant or non-UNIDO co-financing)
Human exposure risks to brominated flame retardants in the workplace	Worker awareness coupled with standard industrial chemicals management practice and provision of personal protection as appropriate and as required/enforced by national regulation	While there is no major acute health exposure directly to these chemicals which are received, handled in powder form during production, application of a precautionary principle consistent with modern industrial practice applicable to chemicals use should be applied. This would be primarily based on the normal worker awareness, following the applicable Materials Safety Data Sheets (MSDS), use of appropriate PPE, training on safe procedures and period health monitoring, all of which are required under Turkish regulations for such chemicals and are generally in place in these facilities. If anything, the risks will be inherently decreased if as expected the	All EPS and XPS facilities involved	Throughout the project	Enterprise management MoEU	Included in normal operational costs and government enforcement costs

E&S risks identified during PPG Stage (Full description above)	Mitigating Measure	Technical details of the mitigation technology, process, equipment, design and operating procedures	Location	Timeline, including frequency, start and end date	Responsibility	Cost of Mitigation (If Substantial; to be covered by the GEF grant or non-UNIDO co-financing)
<p>Environmental release risks from production: As in any operation utilizing chemical inputs a potential risk of unintended release of the chemical via an available environmental path exist in these production operations</p>	<p>Ensuring required industrial chemical management practices and infrastructure are in place and implemented. Regulatory inspection and monitoring</p>	<p>As in any operation utilizing chemical inputs a potential risk of unintended release of the chemical via an available environmental path exist in these production operations. The main environmental paths of concern are particulate release to ambient air within the workplace that extends to the broader external environment, process waste water contamination (in this case largely restricted to EPS pre-blended polystyrene plants) and generation of flame retardant contaminated solid waste. This risk would be mitigated by ensuring well maintained and contained chemicals storage, specific handling practices to avoid spills and general release,</p>	<p>All EPS and XPS facilities involved</p>	<p>Throughout the project</p>	<p>Enterprise management MoEU</p>	<p>Included in normal operational costs and government enforcement costs. Limited support from financial support allocations for certification to a recognized environmental management standard where applicable.</p>

E&S risks identified during PPG Stage (Full description above)	Mitigating Measure	Technical details of the mitigation technology, process, equipment, design and operating procedures	Location	Timeline, including frequency, start and end date	Responsibility	Cost of Mitigation (If Substantial; to be covered by the GEF grant or non-UNIDO co-financing)
General environmental and health impact risk of alternative flame retardants:	Public and stakeholder awareness Capacity building for enhanced chemicals management regulation and enforcement	This risk at the most important site- specific level is covered under the category above. However, it might at least be perceived by the broader stakeholder community as being applicable should an alternative that does have specific local and potentially acute environmental impacts were adopted. The mitigation of any real or perceived risk is largely built into the international convention control system that maintains current technical assessments of alternatives, the market trends and supporting regulatory actions of major OECD countries, notably the EU, and specific to Turkey the present and developing of chemicals controls. In terms of the project's interventions, Component 1,	National and local levels periodically through the project	Throughout the project	MoEU	US\$100,000

E&S risks identified during PPG Stage (Full description above)	Mitigating Measure	Technical details of the mitigation technology, process, equipment, design and operating procedures	Location	Timeline, including frequency, start and end date	Responsibility	Cost of Mitigation (If Substantial; to be covered by the GEF grant or non-UNIDO co-financing)
Risk of mixing of HBCD chemical from recycled finished material products	Capacity building respecting customs control and building materials product quality standards enforcement	This is minor risk that is specific to the XPS sector where re-ground scrap XPS board can be used in new production and is a normal practice with a specific facility. The risk occurs if scrap were transferred from a plant using HBCD to one using alternatives. This could be a transitional issue on a small scale and could also involve illegal imports of such waste from neighboring countries. This is mitigated by enhanced action covered under Component 1 related to import controls (Outcome 1.2 Output 1.2.1) and enforcement of product standards (Outcome 1.2, Output 1.2.3)	Border points and project sites	Throughout the project	MoEU, Customs authorities, Department of Building Materials	US\$50,000

E&S risks identified during PPG Stage (Full description above)	Mitigating Measure	Technical details of the mitigation technology, process, equipment, design and operating procedures	Location	Timeline, including frequency, start and end date	Responsibility	Cost of Mitigation (If Substantial; to be covered by the GEF grant or non-UNIDO co-financing)
Improper waste management risks applicable to disposal of scrap material as a result of trials, residual stockpiles of HBCD, and HBCD containing product generated from demolition waste	Inclusion of HBCD containing waste in national strategy development for POPs containing waste. Enforcement of national solid and hazardous waste management regulations	This risk relates largely to legacy wastes from demolition which historically would contain HBCD albeit in low concentration well below the Stockholm Convention definition of POPs waste. This is to be addressed under Component 1, Outcome 1.3, Output 1.3.1 which involves supporting HBCD related POPs containing waste management strategies. Disposal issues associated with future scrap including trials will be undertaken in accordance with national solid waste management regulations that are harmonized with the EC directives and enforced by MoEU. These prohibit open burning which might generate dioxin and furan brominated unintended	All EPS and XPS facilities involved	Throughout the project	Enterprise management MoEU	Included in normal operational costs and government enforcement costs Enterprise and government C//F US\$25,000 (Output 1.3.1)



E&S risks identified during PPG Stage (Full description above)	Mitigating Measure	Technical details of the mitigation technology, process, equipment, design and operating procedures	Location	Timeline, including frequency, start and end date	Responsibility	Cost of Mitigation (If Substantial; to be covered by the GEF grant or non-UNIDO co-financing)
Risk of Import and export of EPS and XPS products containing HBCD	Capacity building for regulatory control and enforcement of building materials standards	This risk is being addressed through the project by the now adopted regulations prohibiting import and export of such products and the capacity strengthening being supported under the project for custom's controls under Component 1, Outcome 1.2, Output 1.2.1. as well as enhancement of building materials enforcement under Output 1.2.3.	Border points and enterprises	Through the project	MoEU, Customs authorities, Department of building Materials	Government C/F, US\$50,000 GEF

E&S risks identified during PPG Stage (Full description above)	Mitigating Measure	Technical details of the mitigation technology, process, equipment, design and operating procedures	Location	Timeline, including frequency, start and end date	Responsibility	Cost of Mitigation (If Substantial; to be covered by the GEF grant or non-UNIDO co-financing)
Failure of small-scale manufacturers as a result of competitive issues created by mandatory elimination of HBCD	Technical capacity support and equitable offset funds.	This risk with associated impact on economic activity and local employment potential exist where a small less sophisticated enterprise can not cope or afford the necessary investment to eliminate HBCD and replace it with a safe alternative in a competitive product. It is addressed in the project through the technical capacity support provided under Components 2 and 3 and specifically Outcomes 2.2, 2.2, 3.1 and 3.2 where individual and technical support is provided both individually and collectively. Additionally, the allocation of grant funding to offset phase out investment will take into account the deficits experienced by	Small at risk enterprises	In the project early stages with periodic supervision follow up	MoEUMoIT	Included in Output costs and enterprise allocations.

E&S risks identified during PPG Stage (Full description above)	Mitigating Measure	Technical details of the mitigation technology, process, equipment, design and operating procedures	Location	Timeline, including frequency, start and end date	Responsibility	Cost of Mitigation (If Substantial; to be covered by the GEF grant or non-UNIDO co-financing)
Public safety risks created by use of building materials without flame retardants	Monitoring of market Capacity building for building materials standards enforcement	<p>A risk exist that users of these products in applications where fire safety is paramount may elect to use product without flame retardants. This could occur in the event costs of non-HBCD product with alternatives is excessive or there is a supply shortage in the domestic market. Inherently, these risks are low in practice given that there is already competitive producers of product with non-HBCD flame retardant produced in Turkey and is readily available. Initial price differentials are small (3 to 5%) and is the case in (if?) such transitions only applies for a short period noting the strong prospect of more high quality non-HBCD flame retardant producers entering the global market. The project's</p>	Across the country	Throughout project	Department of Building materials	Covered above.

**Supporting Documents**

Upload available ESS supporting documents.

Title	Module	Submitted
<b>ESMP Report - Turkey</b>	<b>CEO Endorsement ESS</b>	

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

**Applicable GEF Strategic Objective and Program:**

CW1-1: Phaseout, elimination and avoidance of HBCD, a chemical of global concern, and its waste in the environment and in processes, materials and products, namely EPS/XPS insulating foam consistent with country obligations under the Stockholm Convention

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
<p><b>Objective:</b> To promote the replacement of persistent organic pollutants with environmentally sound alternatives in the EPS and XPS foam industries in Turkey</p>	Quantity of HBCD consumed and number of enterprises eliminating the use of HBCD in the production of EPS and XPS in Turkey by conversion to environmental sound alternatives.	<p>? No phaseout of HBCD initiated in XPS and EPS sectors on initial project approval and country assumption of phase out obligations (2016)</p> <p>? Consumption of HBCD in the EPS and XPS sectors is 1,919 t/year including imports.</p> <p>? Total production of HBCD EPS and XPS containing product 521,000 t/year.</p>	<p>? Two (2) producers of pre blended PS and three (3) XPS have eliminated HBCD use.</p> <p>? Imports of HBCD containing pre-blended PS reduced to 120 t/year.</p> <p>? HBCD Phase out in EPS and XPS sectors of 1,189 t/year</p> <p>? Total production of HBCD EPS and XPS containing product eliminated is 261,000 t/year</p>	<p>? Four (4) producers of pre blended PS and six (6) XPS have eliminated HBCD use</p> <p>? Imports of HBCD containing pre-blended PS eliminated.</p> <p>? Equivalent HBCD consumption eliminated in EPS and XPS sectors of 1,919 t/year</p> <p>? Production of 521,000 t/year of HBCD containing product eliminated.</p>	<p>? Project progress/supervision reports.</p> <p>? Regular enterprise/ and industry association reports</p> <p>? Regulatory inspection reports.</p> <p>? Customs authority reporting.</p>	<p>? Availability of cost effective HBCD alternatives.</p> <p>? Enterprise fail to meet HBCD elimination obligations</p>

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
	Implemented regulatory framework for enforcement of bans on use and import of HBCD within an overall chemicals management that is harmonized with the EU and international practice	<p>? Turkey has initiated a program targeting EU harmonization in relation to chemicals management inclusive of HBCD elimination and the private sector has initiated the phase out of HBCD.</p> <p>? HBCD is covered by amendment of national POPs regulation but not fully enforced while exemption provision of the Turkey's adoption of its coverage under the SC apply.</p> <p>? Turkey's chemical management and registration framework not yet fully developed limiting comprehensive enforcement on use and import of HBCD pending full harmonization with international regulations.</p> <p>?</p>	<p>? Gaps in regulatory control measures within the current framework governing chemicals management, POPs and specifically HBCD being actively addressed in MoEU and other agencies.</p> <p>? Training and capacity building on regulatory and technical performance control of HBCD and HBCD containing products undertaken.</p> <p>? Development of strategy studies on management of HBCD containing waste initiated</p> <p>? Imports of HBCD in imported pre-blended PS reduced to 120 t.year</p>	<p>? Comprehensive regulatory control measures within the current framework governing chemicals management and POPs and specifically HBCD harmonization with international practice.</p> <p>? Capability for effective enforcement of bans on HBCD and HBCD containing products and technical performance control in place</p> <p>? Strategy for management of HBCD containing wastes adopted.</p> <p>? Imports of HBCD in imported pre-blended PS eliminated (240 t/year).</p>	<p>? Task specific reports and technical documentation</p> <p>? Supervisory consultant reports</p> <p>? Import reporting from Customs Authorities and industry partners</p>	<p>? Lack of policy commitment to support comprehensive chemical management and control measures</p> <p>? Import data on HBCD and HBCD containing product unavailable</p> <p>? Lack of resources to process required regulatory measures and enforcement action.</p>

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
	Tracked and quantified elimination of HBCD use and imports by the EPS and EXPS sectors	? No systematic national data collection and reporting undertaken until done so during the project's PPG stage that established a baseline for consumption in both sectors.	? Regular enterprise reporting on HBCD consumption established coordinated through EPS/XPS Associations ? . ?	? Regular enterprise reporting on HBCD consumption and imports established and coordinated through EPS/XPS Associations and custom's authorities  ?	? Enterprise, industry association and custom authority reports	? Lack of cooperation by private sector entities and custom's authorities ? Failure to enforce chemicals import registration requirements as applied to HBCD . ?
	Turkey is in full compliance with its SC Annex A obligations with respect to HBCD and providing support to other developing countries in achieving that status	? Turkey is generally in compliance with its obligations under the SC but in the case of elimination of the Annex A chemical HBCD is operating under the provision for a limited time exemption.	? Turkey finalizes and notifies the SC on the date at which its current exemption respecting HBCD will be removed.	? Turkey has removed exemption provisions respecting HBCD and is operating in full compliance with the SC. ? Turkey has disseminated results and lessons learned in the project internationally.	? MOEU regulatory documents produced. ? Project supervision reports. ? SC convention reporting documents	? Change in public policy commitment to EU harmonization and to adopting a developed country donor role.

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
	<ul style="list-style-type: none"> <li>- Majority of women's participation will be provide in activities</li> <li>- Encourage female candidates and pay attention to gender equality in procurement processes of experts</li> <li>- Achievement of human empowerment</li> <li>- Paying attention to usage of gender sensitive language in all documents.</li> </ul>	<ul style="list-style-type: none"> <li>- In both sectors employment of women is low in production operations and management</li> <li>- Majority of people living in the areas that include these sectors are lack of education on gender equality</li> <li>- In these sectors, working areas are mostly gender oriented.</li> <li>- Access of resource and technology mostly in the management of men</li> </ul>	<ul style="list-style-type: none"> <li>? - As a result of awareness activities on gender norms and gender equality majority of the employees will be informed.(Gender components incorporated in 3 awareness events)</li> <li>? - Education on gender sensitivity will be given (gender components incorporated into 2 training programs)</li> <li>? - Women's employment in the EPS and XPS sectors increased by 25</li> </ul>	<ul style="list-style-type: none"> <li>- Participation rates of suitable females in sector will be increased.</li> <li>- HBCD-induced health problems on genders will be prevented</li> <li>- sectors will be informed on gender equality</li> <li>- Gender components incorporated into 6 awareness and 4 training events</li> </ul> <p>Women's employment in the EPS and XPS sectors increased by 99</p>	<ul style="list-style-type: none"> <li>? - Human Development Index Data of UNDP</li> <li>? - World Bank Group Turkey Gender Assessment Documents</li> <li>? - BRS Secretariat Documents on Gender Action Plan</li> <li>- Data from State Personnel Presidency</li> </ul>	<ul style="list-style-type: none"> <li>? lack of participation (especially women) in awareness raising and gender activities</li> <li>? lack of increase in female employment due to cultural prejudices</li> </ul>

**Component 1: Regulatory strengthening, capacity building, stakeholder awareness and verification of environmentally sound alternatives for the replacement of HBCD**



	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
<p><b>Outcome 1.1</b> - Up to date non-proprietary information respecting HBCD alternatives and facilitated access to them provided and broad stakeholder awareness on the issue communicated</p>	<p>Increased awareness for stakeholders impacted by the elimination of HBCD in the EPS and XPS sectors including producers, their customers, supply chains, impacted communities, institutional stakeholders and civil society including women.</p>	<p>? Limited information availability, awareness at the institutional, user, consumer and public levels respecting alternatives to HBCD and impact of HBCD elimination.</p>	<p>? International references and expert contacts documented for dissemination to industrial stakeholders in the EPS and XPS sectors.            ? Three (3) introductory workshops/information dissemination sessions on project scope, importance of EPS/XPS sectors, HBCD alternatives and access to them, targeting the following stakeholders ? institutions, private sector users/customers/supply chain participants, and external stakeholders (product consumers, impacted communities, women?s advocacy group and civil society stakeholders generally impacted by HBCD phaseout).            ? Project web-site and social media platform established</p>	<p>? Project closure workshop for key stakeholders presenting project result, lesson learned and future chemicals management challenges.            ? Up to date web-site and social media based outputs throughout the project            ? Project technical and methodology results documented and widely disseminated in Turkey and internationally through UNIDO.</p>	<p>? Project status reports            ? Workshop materials and feedback documentation            ? Supervision reports            ? Web-site and social media records</p>	<p>? Sufficient resources not available            ? Lack of international expert support            ? Low stakeholder participation</p>

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
<b>Outcome 1.2:</b> Regulatory capacity support for control and enforcement to sustained HBCD phase out delivered	Effective chemicals management regulatory control applied to HBCD and alternatives through its comprehensive within the regulatory framework provided for in regulations governing POPs, chemicals management and registration including import and export, and application of performance standards applicable to EPS and XPS building materials ?	? General regulatory framework for POPs tracking SC obligations but with gaps in coverage and enforcement for new POPs such as HBCD Developing but fragmented regulatory framework for sound chemicals management that is progressing to harmonization with international control measures but not yet providing registration and import//export control consistent with international requirements ? Imports of pre-blended PS from Asia remains (240 t HBCD/year) ? National capability for control of EPS and XPS performance standards lacks capability to differentiate	? Gaps in regulatory control measures within the current framework governing chemicals management, POPs and specifically HBCD being actively addressed in MoEU and other agencies. ? Training for MoEU, TSE, and Custom's staff undertaken on control of HBCD and HBCD containing products undertaken.(2 training events with 50 participants each) ? Capacity building for enhanced EPS and XPS product control in terms of performance standards and differentiation between HBCD and alternative containing products ? Imports of HBCD containing pre-blended PS reduced to 120 t/year. ? Training of 275 MoEU and Custom's	? Comprehensive regulatory control measures within the current framework governing chemicals management and POPs and specifically HBCD harmonization with international practice. ? Capability for effective enforcement of bans on HBCD and HBCD containing products in place withing MoEU, TSE. and Customs authority ? Imports of HBCD containing pre-blended PS eliminated. ? Full performance control capability for EPS and XPS products using alternatives FRs supported by TSE ? Training of 450 MoEU/customs inspection staff and 320 product standards inspectors on HBCD detection undertaken	? Task specific reports and technical documentation ? Supervisory consultant reports ? Import reporting from Customs Authorities and industry partners	? Lack of policy commitment to support comprehensive chemical management and control measures ? Import data on HBCD and HBCD containing product unavailable ? Lack of resources to process required regulatory measures and enforcement action.

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
<b>Outcome 1.3:</b> Measures for the control and environmentally sound management of HBCD containing waste implemented.	National management strategy for POPs containing wastes including HBCD is implemented	? National waste management regulatory framework for hazardous waste for environmentally sound treatment and disposal is in place but does not fully encompass all POPs containing waste including those containing EPS and XPS production wastes and end of life EPS and XPS products.	? Development of a national strategy for the management of POPs containing waste including HBCD has been initiated.	? A national strategy for the management of POPs containing waste has been developed and is being implemented with particular emphasis on HBCD containing waste.	? Strategy development documents. ? Expert study reports ? Project supervision reports	? Lack of policy commitment to support regulatory action on waste management strategy. ? Lack of financing for required supporting infrastructure ?
<b>Component 2: Elimination of HBCD use in the EPS sector in Turkey</b>						

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
<b>Outcome 2.1:</b> Pre-blended polystyrene (PS) producers have required technical information and capability to complete selection and production of alternative flame retardant containing production	Sufficient knowledge and technical/operational capacity exists within all producers of pre-blend PS on an equitable basis.	? Knowledge of alternatives and technical/operational capacity within individual pre-blended PS producers varies and presents a barrier for smaller producers to complete elimination of HBCD	? All 4 (four) pre-blended PS producers are offered and as required are utilizing international/national expertise, technical information and commercial contacts to complete phase out of HBCD.  ? Information dissemination undertaken to producers of final EPS products, including those directly importing HBCD based inputs.  ? 2 training events completed	? All 4 (four) pre-blended PS producers demonstrate capacity and knowledge though continued operation on a competitive basis with environmentally sound alternatives.  ? All national EPS final product producers are using inputs containing HBCD alternatives  ? 3 training event completed	? Expert reporting  ? Technical documentation disseminated  ? Project supervision reports	? Qualified expertise is not available  ? Enterprises do not accept technical support  ? Enterprises not competitive with HBCD alternatives

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
<p><b>Outcome 2.2:</b> National EPS association (EPSDER) is technically supported in its programing to provide collective information and supporting laboratory capability for members on the use of alternative flame retardant in all stages of EPS production.</p>	<p>EPSDER provides the EPS sector with access to common and current technical and operational information on HBCD alternative information to eliminate HBCD usage and maintain the domestic EPS sectors competitive position after completing elimination inclusive of supporting laboratory capability available to members.</p>	<p>? EPSDER has an effective communication with a broad base of preblended PS producers, end product producers and supply chain enterprises but lacks access and technical support capability to provide the necessary support to members, including limitation in capability related to product testing laboratory capacity.</p>	<p>? Inception Phase technical workshop on alternatives and their operational application provided to all four preblended PD producers            ? Current technical materials, technical expert contacts and commercial contacts with known alternative suppliers prepared and disseminated to EPSDER members.            ? The TSE/CEVKAK laboratory available to support product testing and certification has initiated capacity upgrading and service provisions to both EPS and XPS sectors.</p>	<p>? Closing technical workshop for EPSDER members on project results.            ? All EPSDER members fully familiar with technical principles, opportunities and lessons learned regarding the transition to environmentally sound FRs.            ? TSE/CEVKAK laboratory providing effective product development and certification support to both the EPS and XPS sectors</p>	<p>? Workshop documentation and attendee survey results.            ? Technical documentation disseminated            ? Project supervision reports            ? EPSDER membership surveys</p>	<p>? Lack of EPSDER membership participation</p>

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
<p><b>Outcome 2.3:</b> Complete phase out of HBCD use in domestic production of preblended polystyrene production (975 t HBCD/year) used in the EPS sector directed to national markets is achieved</p>	<p>Quantity of HBCD consumed and number of enterprises eliminating the use of HBCD in the production of EPS in Turkey by conversion to environmental sound alternatives.</p>	<p>? No elimination of HBCD initiated in EPS sectors on initial project approval and country assumption of phase out obligations. ? ? Consumption of HBCD in the EPS sector 975 t/year excluding imports. ? Total production of HBCD EPS containing product 66,573 t/year. ? Baseline compliance with national workplace, health and safety standards and environmental release regulations</p>	<p>? Two (2) of four (4) producers of pre blended PS eliminated HBCD use in EPS sector. ? HBCD elimination in EPS sector of 881 t/year ? Production of 50,000 t/year of HBCD containing EPS preblended PS product eliminated. ? Confirmation inspections respecting compliance with national workplace health and safety standards, and environmental release regulations</p>	<p>? Four (4) producers of pre blended PS eliminated HBCD use in EPS sector. ? Equivalent HBCD consumption eliminated in EPS sector of 975 t/year ? Production of 66.575 t/year of HBCD containing preblended PS EXP product eliminated. ? Environmental management system certification in place for all enterprises</p>	<p>? Project progress/supervision reports. ? Regular enterprise/ and industry association reports ? Regulatory inspection reports. ? Custom's authority reporting.</p>	<p>? Availability of cost effective HBCD alternatives. ? Enterprise fail to meet obligations</p>
<p><b>Component 3: Elimination of HBCD use in the XPS sector in Turkey</b></p>						

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
<b>Outcome 3.1:</b> XPS producers have required technical information and capability to complete selection and production of alternative flame retardant containing production.	Sufficient knowledge and technical/operational capacity exists within all XPS producers on an equitable basis.	? Knowledge of alternatives and technical/operational capacity within individual pre-blended PS producers varies and presents a barrier for smaller producers to complete elimination of HBCD	? All six (6) participating XPS producers are offered and as required are utilizing international/national expertise, technical information and commercial contacts to complete elimination of HBCD. ?	? All six (6) participating XPS producers demonstrate capacity and knowledge though continued operation on a competitive basis with environmentally sound alternatives.	? Expert reporting ? Technical documentation disseminated ? Project supervision reports	? Qualified expertise is not available ? ? Enterprises do not accept technical support ? ? Enterprises not competitive with HBCD alternatives

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
<p><b>Outcome 3.2:</b> National XPS association (ISODER) is technically supported in its programing to provide collective information for members on the use of alternative flame retardant in all stages of XPS</p>	<p>ISODER provides the XPS sector with access to common and current technical and operational information on HBCD alternative information to eliminate HBCD usage and maintain the domestic XPS sectors competitive position after completing elimination.</p>	<p>? ISODER has a effective communication with a broad base of XPS producers and supply chain enterprises but lacks access and technical support capability to provide the necessary support to members, including limitation in capacity related to product testing laboratory capacity.</p>	<p>? Inception Phase technical workshop on alternatives and their operational application provided to all six participating XPS producers ? Current technical materials, technical expert contacts and commercial contacts with known alternative suppliers prepared and disseminated to ISODER members. ? The TSE/CEVKAK laboratory available to support product testing and certification has initiated capacity upgrading and service provisions to the XPS sectors.</p>	<p>? Closing technical workshop for ISODER members on project results.  ? All ISODER members fully familiar with technical principles, opportunities and lessons learned regarding the transition to environmentalall y sound FRs.  ? TSE/CEVKAK laboratory providing effective product development and certification support to both the EPS and XPS sectors</p>	<p>? Workshop documentation and attendee survey results. ? Technical documentation disseminated ? Project supervision reports ? ISODER membership surveys</p>	<p>? Lack of ISODER membership participation</p>



	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
<p><b>Outcome 3.3:</b> Complete phase out of HBCD use in domestic production of XPS production (705 t HBCD/year) used in the XPS sector is achieved</p>	Quantity of HBCD consumed and number of enterprises eliminating the use of HBCD in the production of XPS in Turkey by conversion to environmental sound alternatives.	<p>? No phaseout of HBCD initiated in XPS sectors on initial project approval and country assumption of phase out obligations (2016)</p> <p>? Consumption of HBCD in XPS sector 635 t/year.</p> <p>? Total production of HBCD XPS containing product 454,000 t/year.</p> <p>? Baseline compliance with national workplace, health and safety standards and environmental release regulations</p>	<p>? Three of six enterprises in the XPS sector phased out HBCD consumption.</p> <p>? HBCD equivalent Phase out of HBCD in the XPS sector 303 t/year.</p> <p>? Production of 163,000 t/year of HBCD containing XPS product eliminated.</p> <p>? Confirmation inspections respecting compliance with national workplace health and safety standards, and environmental release regulations</p>	<p>? Six (6) enterprises in the XPS sector eliminated HBCD consumption.</p> <p>? HBCD equivalent consumption of 7055 t/year eliminated in the XPS sector.</p> <p>? Production of 454,000 t/year of HBCD containing XPS product eliminated.</p> <p>? Environmental management system certification in place for all enterprises</p>	<p>? Project progress/supervision reports.</p> <p>? Regular enterprise/ and industry association reports</p> <p>? Regulatory inspection reports.</p> <p>? Custom's authority reporting.</p>	<p>? Availability of cost effective HBCD alternatives.</p> <p>? Enterprise fail to meet obligations</p>

**Component 4: Monitoring and Evaluation**

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
<b>Outcome 4.1:</b> Outcomes from project activities assessed and lessons learnt disseminated for sustainable replication	M&E applied to project in response to needs, mid-term review findings with lessons learned extracted.	? No Monitoring and Evaluation system ? No evaluation of project output and outcomes	? Monitoring and Evaluation system developed and applied including gender and ESMP monitoring ? Mid-term-review of project output and outcomes conducted with lessons learnt at 24 months of implementation.	? Final evaluation report ready in the end of project	? CEO Endorsement Proposal ? GEF Sec. and Council Input.& Guidance ? Inception workshop report. ? Independent mid-term review report.	? Availability of reference material and progress reports ? Cooperation of stakeholder agencies and other organizations.

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

Project review responses were received from GEF Secretariat (GEF Secretariat Review for Full Sized Project ? GEF ID# 10082 dated 11/20/2018), the GEF STAP (dated 12/5.2018), and from the Government of France (dated 1/19/2019). Points to be addressed in the PPG stage are responded to as follows:

*GEF Secretariat Comments:* The GEF Secretariat review cleared the project unconditionally except for the request to elaborate on Core Indicators 6 (Greenhouse Gas Emissions Mitigated) and 9 (Reduction, disposal/destruction, phase out, elimination and avoidance of chemicals of global concern and their waste in the environment and in processes, materials and product).

In the case of greenhouse gas mitigation, the directional aspects in which the project will serve to reduce GHG emissions are further elaborated in this document including a direct contribution to energy efficiency by maintaining and potentially expanding the use of insulating foam in the construction sector, and indirectly through synergy with replacement of high global warming potential foam blowing agents both of which will be further evaluated in the course of project implementation to more accurately quantify these during implementation

Likewise the primary GEB?s from elimination of HBCD in the Turkish EPS and XPS sectors have been further quantified consistent with interests expressed by the GEF Secretariat, namely as i) total annual HBCD consumption elimination, ii) total HBCD elimination over the project life; and ii) the quantities of EPS and XPS production in which HBCD use is eliminated both annually and over the project life, noting that the latter equates to the avoidance of long term HBCD containing waste over that period.

*GEF STAP Comments:* The overall GEF STAP assessment was to strongly recommend the project with the qualification of addressing several issues classed as minor. The following states these and how they have been addressed at the PPG stage and in this document:

- ? It was recommended that the project duration should be extended four years due to its assumed complexity. UNIDO believes that three years is feasible
- ? It was recommended that the analysis and verification of the use and alternatives to HBCD-based flame retardants should not only focus on the state-of-the-art in Turkey but should be global in order to ensure that the Best Available Technology that is Economically Achievable is identified and deployed. This is in fact the approach adopted by the project design as reflected in the document, particularly noting the coordination with the parallel GEF UNIDO HBCD project in China and connection to what is BAT being applied in the EU.
- ? It was noted that the risk assessment undertaken needs elaboration, particularly respecting regulatory compliance risks. This is now included in this document along with elaboration of the strong emphasis in Component 1 on institutional capacity.
- ? Project barriers have been elaborated and further to aligned with the various components of the project.
- ? Global Environmental Benefits have been further elaborated and refined as suggested including directional aspects of climate change impact mitigation.
- ? The academic community have been included as stakeholders and generally the role of stakeholders is defined in a tabular Stakeholder Management Plan as recommended.
- ? No formal indicators for Knowledge Management have been identified but the actions undertaken are defined and quantification of knowledge management outputs will be undertaken in the monitoring and evaluation process

*GEF Council Member (France) Comments:* The support provided in this comment for linkage between the project and parallel MLF projects including the phase out of HCFC blowing agents in these sectors is retained and expanded in the context of current initiatives to address HFCs as F-gases through MLF funded enabling activities respecting the Montreal Protocol Kigali Amendment and supporting EU technical assistance. In particular compatibility with low GWP blowing agencies is identified as a factor in selecting HBCD alternatives. Additionally, the Council Member expressed interest in the cost effectiveness ratio of HBCD technologies and the additional costs of investment and exploitation of these, has been initially addressed at the PPG stage and will be key factors in the ultimate selection of HBCD alternatives.

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

PPG Grant Approved at PIF: 120,000			
<i>Project Preparation Activities Implemented</i>	<i>GETF/LDCF/SCCF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent To date</i>	<i>Amount Committed</i>
Coordination mechanism for PPG management and organization	15,000	13,000	2,000
Identification and engagement of key stakeholders in public and private sectors	10,000	10,000	0
Baseline data collection at participating industries and analysis for project document preparation	40,000	37,500	2,500
Preparation of environmental and social management plans	15,000	15,000	0

Gender assessment	10,000	10,000	0
Development of project workplan and project document	30,000	16,763	10,950
Total	120,000	102,263	15,450

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

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



### Coordinates Legend

Izocam	40°56'16.68"N 29° 8'6.45"E
Wallboard	37° 5'9.23"N 37°26'28.20"E
Eryap	41° 4'17.63"N 28°19'14.54"E
Aschem	36°55'29.26"N 35°59'43.41"E
Dioki	36°55'21.44"N 35°59'23.06"E
Ravago	38°48'48.92"N 27° 2'49.82"E
CFN	40°48'37.19"N 29°33'29.98"E
ODE	41° 3'42.53"N 28°58'25.12"E
Dinamik	38° 7'18.39"N 27°42'20.46"E
BTM 3	8°27'23.33"N 27°22'6.34"E

## ANNEX E: Project Budget Table

Please attach a project budget table.

Please refer to the uploaded Budget Table

### ANNEX F: (For NGI only) Termsheet

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

**ANNEX G: (For NGI only) Reflows**

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

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

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