

# Reducing Releases of PBDEs and UPOPs Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia

## Mid Term Review Report

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## 1. EXECUTIVE SUMMARY

### 1.1. PROJECT INFORMATION TABLE

GEF Project ID	5052
UNDP PMIS ID	5073
Funding Source	GEF Trust Fund
Project Name	Reducing Releases of Polybromodiphenyl Ethers (PBDE) and Unintentional Persistent Organic Pollutants (UPOPs) Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia
Country	Indonesia
Region	Asia and the Pacific
Focal Area	Persistent Organic Pollutants
GEF Cycle	GEF-5
PIF Approval Date	20/02/2013
Approval Date	11/12/2014
Project Status	IA Approved
Executing Agency	UNDP
Description	
PPG cost	100,000 USD
GEF project grant	3,990,000 USD
GEF Agency Fees	379,050 USD
Co-financing Total	18,731,594 USD
Total Project Cost	22,821,594 USD

## 1.2. PROJECT DESCRIPTION

The project “Reducing Releases of Polybromodiphenyl Ethers (PBDE) and Unintentional Persistent Organic Pollutants (UPOPs) Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia ” has the purpose to support the country to prevent that the harmful PBDEs enter the recycled material and are released in the environment. The project therefore works on several fronts:

1. on the side of plastic recycling industry, by developing capacity to identify PBDE contaminated plastic and ensuring that this plastic would not enter the recycling process, but will be instead segregated and properly disposed of;
2. on the side of enhancing the sound management of waste, by preventing that PBDE contaminated waste are improperly dumped or even burned in the open;
3. on the side of capacity building and regulation, by improving the Indonesian environmental legislation, including target limits for PBDE in plastic articles and waste.

The general project objective is *“To reduce releases of PBDEs and UPOPs by improving overall life-cycle management of plastics and PBDEs-containing plastics through the introduction of alternatives to PBDEs in plastics manufacturing processes and the application of BAT/BEP in plastics recycling and disposal practices.”*

The project is structured in 5 components

- Component 1: Strengthening the national policy and regulatory framework to reduce UPOPs and PBDE releases from plastics manufacturing, recycling and disposal practices;
- Component 2: Reducing or eliminating the import and use of PBDEs in plastics manufacturing;
- Component 3: Reducing of UPOPs and PDBEs from unsound plastics recycling;
- Component 4: Reducing releases of UPOPs and PBDEs from unsound plastic disposal practices;
- Component 5: Monitoring, learning, adaptive feedback, outreach, and evaluation

## 1.3. PROJECT PROGRESS SUMMARY

In summary, on the side of development of draft legislation, preparation and communication of guideline documents, the project is in line with the schedule. Training of recyclers and manufacturers have been completed, although the impact of these actions was limited; the project is late on the side of development of waste management infrastructures (mini-depots), out of which only 2 will be operational by the end of the 4th year of the project; very limited progresses have been achieved concerning PBDE plastic segregation and disposal and the project is at risk of not achieving this target. The achievement by project output can be summarized as follows:

**Component 1:** a draft of regulation on controlling the use of PBDE and other dangerous chemicals listed under the Stockholm Convention is prepared as revision of PP 74 of 2001 on Hazardous and

Toxic Substance Management and led by the Ministry of Environment and Forestry (MoEF) and supported by Ministry of Industry (Mol) along with other related ministries. This effort has taken at least two years, but still has not reached any conclusion because of the different perspectives of the two Ministries. PP 74 of 2001 is currently in the hand of Coordinating Ministry of Law and Human Rights. The project has developed Indonesia national standard for PBDE restriction on plastic-based products. Concerning **Component 2**, Output 2.1 and Output 2.2, a set of technical guideline documents and trainings have been delivered. The training was developed through classroom lessons, tryout lessons, focus group discussion (FGD), videos, addressed to both manufacturers of plastic components and recyclers. Although the guidelines for plastic recycler and manufacturer have been delivered, the observed impact is still limited. **Component 3:** the project conducted a study based on gender and livelihood of female and male workers in the plastics and electronic waste recycling sector. This study was done by involving 46 women and 72 men plastics recycle workers from several formal and informal recycling industries across West and East Java, specifically in Bekasi, Depok, Cianjur, Bandung, and Jombang Regions. The target for this output contains a clear requirement on the technical guidelines *“to be integrated into 3 plastic recycling practices”* (target for the year 3). This target has not achieved as either from the site visits and from the final reports from the consultant (AMC), it is evident that the operation modalities of the recyclers remained basically unchanged. So far, no PBDE contaminated waste have been identified, although, from the site visits, it was evident that significant amount of non recyclable “heavy” plastic which could be PBDE contaminated is usually set aside; this plastic is currently being incinerated in small brick factories (a procedure equivalent to open burning). Discussion with cement industry as potential partner for the disposal of PBDE contaminated plastic started in late April 2019 (after the mission of the reviewers). As far as the development of the mini-depots is concerned (**Component 4**), one mini-depots infrastructure has been built in Cirebon, and the procurement of the waste segregation and treatment equipment is ongoing; the project management shared a timeline for the instalment of the second mini-depots (Depok) which span until March 2020, with procurement activities to be concluded in May 2019. The time schedule seems quite tight, however even if fulfilled, this means that the second mini-depots will be not operational before a year.

Table 1: Time schedule for the building and operation of mini-depots shared by the PMU

Timeline Schedule of PRDF & UPDS Project																					
No	Item	2019						2020													
		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Mini Depot in Cirebon</b>																					
1	PO issuance on mini depot occupation																				
2	Equipment manufacture																				
3	Installation and training (fully operational)																				
4	Handover of mini depot Cirebon																				
5	Collecting, segregating, recycling, and disposing waste containing PRDF																				
<b>Mini Depot in Depok</b>																					
1	Consultant recruitment																				
2	Advertisement for mini depot construction																				
3	Bidders' conference for mini depot construction																				
4	Evaluation of bidding and Contract commencement																				
5	Construction																				
6	Retention phase																				
7	TOB and tender document for mini depot equipment																				
8	Advertisement on equipment for mini depot																				
9	Bidders' conference on equipment for mini depot																				
10	PO issuance																				
11	Equipment manufacture																				
12	Installation and training (fully operational)																				
13	Handover of mini depot in Depok																				
14	Collecting, segregating, recycling, and disposing waste containing PRDF																				
<b>Mini Depot in Kart Jaya (Malang, PRDF Project only provides equipment which will be installed in the existing building)</b>																					
1	TOB and document on tender for mini depot equipment																				
2	Advertisement on equipment for mini depot																				
3	Bidders' conference on equipment for mini depot																				
4	PO issuance																				
5	Equipment manufacture																				
6	Installation and training																				
7	Collecting, segregating, recycling, and disposing waste containing PRDF																				
<b>Waste Collection and Disposal (PRDF suspected waste)</b>																					
1	MOU with cement industry																				
2	Recruitment process of third party to collect and dispose waste																				
3	Period of collecting and disposing waste																				

## 1.4. MTR RATINGS & ACHIEVEMENT SUMMARY TABLE

1.4.1. Table. MTR Ratings & Achievement Summary Table for the project.

Measure	MTR Rating	Achievement Description
Project Strategy	N/A	
Progress Towards Results	<p><b>Objective Achievement</b></p> <p>To reduce releases of PBDEs and UPOPs by improving overall life-cycle management of plastics and PBDEs-containing plastics through the introduction of alternatives to PBDEs in plastics manufacturing processes and the application of BAT/BEP in plastics recycling and disposal practices.</p> <p><b>Rating: 3 (Moderately Unsatisfactory)</b></p>	<p>Although the project achieved good results on training and communication on the environmental and health risk associated to POPs, the expected change on the waste management procedures are still limited. The key GEB target is far to be reached as discussion on the modality for disposal of contaminated plastic just started, and no contaminated plastic have been segregated. Only one mini-depot out of a target of 3 for the third year has been established and its equipment is still under procurement. In the absence of adoption of proper countermeasures, there is a substantial risk that the sought GEB would not be achieved by the project end and that not all the infrastructures needed to promote to change toward better environmental practices would be installed. It is very likely that a project extension would be needed to achieve the targeted GEB.</p>
	<p>Outcome 1: Strengthening the national policy and regulatory framework to reduce U-POPS and PBDE releases from the use of plastics manufacturing, recycling and disposal practices.</p> <p><b>(Achievement Rating: 4 Moderately Satisfactory)</b></p>	<p>Most of the guidelines on PBDE plastic management have been prepared and communicated with stakeholders.</p> <p>A draft on regulation on controlling the use of PBDE and other dangerous chemicals listed under the Stockholm Convention is prepared as revision of PP 74 of 2001 on Hazardous and Toxic Substance Management, however its enactment is out of the reach of the project.</p> <p>Training and communication for the relevant period carried out.</p>
	<p>Output 2.1 Achievement Rating:</p> <p>Sufficient national technical expertise built to meet challenges with PBDEs in manufacturing and plastic raw material recycling.</p> <p><b>(Achievement Rating: 5 Satisfactory)</b></p>	<p>A set of technical guideline documents and trainings have been delivered. The training was developed through classroom lessons, try-out lessons, focus group discussion (FGD), videos, addressed to both manufacturers of plastic components and recyclers. A project champion identified by the project contributed significantly to the promotion of project objectives and gender mainstreaming messages. The impact of the training is however still limited as most of the operators are waiting for the delivery of the mini-depot for implementing best recycling practices.</p>
	<p>Output 2.2 PBDE releases to the environment from the manufacturing sector reduced through phase-out and introduction of PBDE avoiding quality control of raw material and awareness raising.</p> <p><b>(Achievement Rating: 5 Satisfactory)</b></p>	<p>Guidance document, try out sessions and training have been delivered; however the impact is limited as limited changes was observed on the recycling practices. XRF and infrared devices were procured and used to analyse a limited number of plastic samples, but should be used more intensively to amortize their investment and produce a significant information related to the extent of PBDE (Br) concentration in plastic waste and articles.</p>
	<p>Output 3.1: Reduced releases of PBDEs as a result of improved handling, storage, recycling and disposal of PBDEs containing wastes and products through the introduction of BAT/BAP in the plastics recycling sector.</p> <p><b>(Achievement Rating: 4 Moderately satisfactory)</b></p>	<p>Surveys on gender mainstreaming in the plastic sector carried out. Although the training in selected companies has been performed, the companies are reluctant to implement best environmental practices and health protection measures. Recyclers are not yet identifying PBDEs and disposing PBDEs containing waste in the proper way. The technical guideline is not integrated yet in the plastic recycling practices. 10 manufacturers have been certified through ISO9001 as PBDE-free</p>
	<p>Output 3.2: Reduced releases of UPOPs as a result of improved raw material (recycled plastics) supply chains as well as the introduction of environmentally sound disposal</p> <p><b>(Achievement Rating: 2 Unsatisfactory)</b></p>	<p>No PBDE contaminated plastic has been segregated or disposed so far. The discussion on the disposal technology started in April 2019, with cement industry. The project and Ministry of Industry had visited cement industry to discuss collaboration in disposing PBDE-contaminated waste. Currently, non-recyclable plastic is still disposed of through burning in rudimentary brick factories, a process equivalent to open burning. There is substantial risk that no disposal of PBDE contaminated plastic would be carried out if corrective measures are not implemented by the end of the project.</p>
<p>Output 4: PBDEs and UPOPs releases to the environment reduced through the implementation of appropriate disposal options for hazardous and unrecyclable plastic waste fractions from both formal and informal recyclers and waste collectors</p> <p><b>(Achievement Rating: 3 Moderately</b></p>	<p>Only one mini-depo (the one in Babakan Village, Cirebon District, West Java.) has been established although not yet equipped and therefore is not yet operational. No plastic has been diverted from river dumping yet through the mini-depots. Mini depot in Cirebon will be fully operational in August 2019. Meanwhile, two other mini depots will be fully operational in January 2020. There is a substantial risk that even the minimal target of 3 functional mini-</p>	

	<b>unsatisfactory)</b>	depots with 8 tons of plastic / week diverted would not be achieved within the project deadline.
Project Implementation & Adaptive Management	<b>3 Moderately Satisfactory</b>	All the project monitoring tool (TT, PMRs, PIRs, inception report) have been prepared and contain detailed information on the activities carried out. TT are not very informative and contain some inconsistencies. PMR and PIRs reports did not allow for the timely identification of the obstacles which hindered the timely achievement of expected results, (despite some early warning anticipated in technical reports), therefore no corrective action to put the project on track has been identified.
Sustainability	<b>ML: Moderately Likely</b>	The project is strongly supported by all the institutional and private stakeholders, also thanks to the successful awareness campaign carried out. The project is intrinsically sustainable from the point of view of the environment, as its main purpose is to reduce the environmental impact of plastic lifecycle (through environmentally safe production, recycling and waste management). Sustainability of actions aimed at the environmentally sound management of plastic waste may be limited by social and financial aspects related to the small size of informal recycler enterprises.

### 1.5. CONCISE SUMMARY OF CONCLUSIONS

The project “*Reducing Releases of Polybromodiphenyl Ethers (PBDE) and Unintentional Persistent Organic Pollutants (UPOPs) Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia*” Is perceived as high priority both at the institutional level and at the level of private operators, and is consistent with the GEF 6 Chemical and Waste focal area and the country National Implementation Plan of the Stockholm Convention.

Currently the project achieved good results in term of training and awareness raising, and was able to deliver the first infrastructure (mini-depot) for the storage and processing of plastic waste in Cirebon.

A draft on regulation on controlling the use of PBDE and other dangerous chemicals listed under the Stockholm Convention has been prepared but is currently halted due to the different views on the matter of the MOI and MOEF.

The project is late on the delivery of the additional 2 mini-depots, out of which one has been approved and underwent the procurement process.

The project is facing technical and social difficulties (due to the structure and size of informal recycler enterprises) to ensure the implementation of the guidelines for the segregation of PBDE plastic in the plastic recycling sector, with the result that after 3 years of implementation, the segregation and disposal of plastic contaminated by PBDE did not started yet, against a target for the 3rd year was of at least 800 tons of PBDE contaminated plastic disposed of.

### 1.6. RECOMMENDATION SUMMARY TABLE

Rec #	Recommendation	Responsible Entity
A	Output 1: Strengthening the national policy and regulatory framework to reduce UPOPs and PBDE releases from plastics manufacturing, recycling and disposal practices;	

Rec #	Recommendation	Responsible Entity
A.1	As the endorsement of legislation is out of the reach of the project, it is recommended to set as target for this component only the completion of a draft regulation on PBDE and POPs, provided that the draft is approved by the key stakeholders of the project board (MOI, MOEF, UNDP and representatives of manufacturers and recyclers) for submission to the legislative process.	MOEF and MOI
B	Output 2, Activity result 2.1. Sufficient national technical expertise built to meet challenges with PDBEs in manufacturing and plastic raw material recycling	
B.1	A number of inspections at the premises of the recyclers and manufacturers factories should be carried out to understand the actual implementation of the health protection measures at workplace, and try to identify the cause which are currently hindering the adoption of these measures.	PMU, MOE
B.2	MOI should quantify the gender-disaggregated number of participants to training, and should conduct a survey on the situation of disparity of economic treatment between male and female among the operators who attended the training or the awareness raising event. The survey should try to identify the cause which are currently hindering the reduction of disparities among genders in the plastic recycling and manufacturing sector.	MOI
C	Output 3: Reducing of UPOPs and PDBEs from unsound plastics recycling;	
C.1	<p>Carry out a wide sampling and analysis exercise at the recycler premises to quantify the level of PBDE contamination of the non-recyclable plastic in comparison with the recyclable plastic.</p> <p>It is suggested to carry out a number of measurements with XRF in the order of around 5000 and carry out at least 1% of confirmatory analysis with GC/MS, for an overall number of 5050 analyses.</p> <p>To that end, a sampling and analytical plan should be drafted, discussed with experts and potential beneficiaries, and then implemented</p>	PMU and MOI
C.2	<p>Establish as soon as possible a partnership with the cement industry or other potential provider of waste disposal services compliant with the SC BAT/BET to dispose PBDE contaminated plastic and non-recyclable plastic through high-temperature co-incineration.</p> <p>The partnership should include also at least one Proof of Performance test to ensure that the disposal through cement kiln is compliant with the Stockholm Convention BAT/BEP on co-incineration.</p>	PMU and MOI

Rec #	Recommendation	Responsible Entity
C.3	The method to identify and segregate plastic waste contaminated by BFR is still unclear. The adoption of XRF only would not likely allow the identification of large amount of BFR plastic waste and the equipment is too expensive to be considered by communities of recyclers. Methods for the preliminary segregation of BFR plastic waste, based on the knowledge of the source of the waste and physical methods like floating should be formally developed and adopted, so that the amount of plastic that need to be confirmed by XRF may be reduced.	PMU including technical consultants
<b>D Project Management</b>		
D.1	UNDP CO and the project board should develop a timeframe with milestones providing realistic deadlines for the implementation of the above recommendations and all the project output to be completed, so that a request of project extension to UNDP HQ and the GEF can properly substantiated.	UNDP, Project Board

## 2. INTRODUCTION

### 2.1. PURPOSE OF THE MTR AND OBJECTIVES

As from the MTR TOR (Annex 6.1, page 2) the MTR *“will assess progress towards the achievement of the project objectives and outcomes as specified in the Project Document, and assess early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. The MTR will also review the project’s strategy and its risks to sustainability.”*

The project Mid Term Review has then been carried out with this main purpose. In this sense, it has been noted that the proposed MTR TOR chapter on assessment of management is much longer and more detailed than the chapter dedicated to the assessment of project achievements. The reviewer considered that, although is true that management aspects are very important at MTR stage, the project is designed to achieve specific technical goals: no matter how good is the management, if the activities undertaken are not technically sound, the project could eventually fail. In the view of the reviewers is therefore extremely important to understand how the needed technical capacity has been transposed in the management, i.e. whether project managers have the technical knowledge to manage the complex technical issues required by the project, and whether the (unavoidable) knowledge gaps have been properly filled or integrated through the necessary interaction with experts on the relevant aspects (POPs, recycling and disposal technology, social aspects of waste management, plastic manufacturing, etc.).

## 2.2. SCOPE & METHODOLOGY: PRINCIPLES OF DESIGN AND EXECUTION OF THE MTR, MTR APPROACH AND DATA COLLECTION METHODS, LIMITATIONS TO THE MTR

The following have been the fundamental review steps carried out:

Preparation of templates for questionnaires and interviews. As a first stage, based on the list of questions identified in the TOR and in the MTR inception report (Annex **Error! Reference source not found.**), templates for questionnaires and interviews have been developed. These have been used as a guidance for undertaking interviews with project stakeholders. No questionnaire survey has been carried out. The development of the MTR report followed as much as possible the evaluation questions proposed by the TOR.

Interview and meetings. During MTR inception it was requested that at least one person from each of the following entities should be met and interviewed:

- UNDP regional office in Bangkok (this has been done during the visit of Ms. Christine Wellington Moore in Vietnam, as the international MTR consultant is currently based in Vietnam, and through a Skype call on March 18 during the Mid Term Review wrap-up meeting);
- UNDP Country Office representatives in charge of project activities (meetings in Jakarta, Indonesia);
- Members of the Project Board and the NPD (meetings in Jakarta, Indonesia);
- Members of the Project Management Office (meetings in Jakarta, Indonesia);
- Representatives of NGOs or stakeholder associations involved in the project activities (meetings in Jakarta, Indonesia);
- Representatives of industries involved in the implementation of project activities (Site visits and meetings in various places in Indonesia as from the mission agenda);
- Representatives of the Ministries involved in project implementation. (meeting in Jakarta, Indonesia)
- National and international experts and advisors (meetings in Jakarta, Indonesia).

The list of persons met / interviewed is reported in Annex 6.5.

**Missions and site visits.** A mission have been undertaken by the international evaluator in Indonesia during the period 11/03/2019 to 19/03/2019. The agenda of the MTR mission is reported in Annex 6.4..

**Presentation of initial findings.** The findings of the MTR have been shared during the last day of the mission in Indonesia. The purpose of sharing the initial findings of the MTR is to verify with the project institutions and the stakeholders whether the considerations and suggestions resulted from the interviews and site visits are relevant and correct, and to avoid misunderstandings that could have been derived from the lacking or misinterpretation of information.

**MTR drafting.** The consultant integrated the initial finding with the observation received during the last meeting in Jakarta, and proceeded with the drafting of MTR. During this period, interaction with the project team and stakeholders continued to clarify aspects and doubts that can emerge in the course of report drafting.

**Circulation of draft report.** The draft report was circulated on May 1st, 2019 and a certain number of days will be allowed to receive comments from the project team and stakeholders.

**Integration of the reports with comments and circulation of the final report.** The received comments contributed to improve the report, either in case they are accepted or rejected. A separate short report (the audit trail) containing the answer to all the comments and the reason for acceptance or rejection has been prepared and attached as a separate file.

### 2.3. STRUCTURE OF THE MTR REPORT

The structure of the MTR report follows strictly the requirement of the TOR (TOR Annex 6.1)

## 3. PROJECT DESCRIPTION AND BACKGROUND CONTEXT (3-5 PAGES)

### 3.1. DEVELOPMENT CONTEXT: ENVIRONMENTAL, SOCIO-ECONOMIC, INSTITUTIONAL, AND POLICY FACTORS RELEVANT TO THE PROJECT OBJECTIVE AND SCOPE

As from the project document, the baseline situation of the country at the time of the project preparation was as follows:

- The generation of plastic in Indonesia occurs at a very fast and increasing rate;
- The plastic industry is one of the primary industries, and the plastic market expanded even during the global economic slowdown;
- The per capita consumption of plastic in Indonesia is low (10kg/year/person) compared to other countries;
- Over an amount of 38.5 million solid waste generated by the 232 million Indonesian population per year, 14% is plastic;
- Recycling activity lacks a good organization and technological resources, and is mostly in the hand of unformal recyclers;

A number of baseline project have been already implemented or are under implementation by the government, out of which the most relevant are:.

- In term of environmental regulation, there are rules for the monitoring of PCDD/F released by rotary kiln incinerators. The enforcement of these rules is however low and it is evident that there is the need for building capacity in the sector of emission monitoring;
- The GOI has set targets for 2014 and 2019 to significantly reduce waste volumes, increase the recycling and improved the solid waste management in the country;
- The government is carrying out a green economy strategy, with specific policies aimed at subsidising and incentivising industries to promote environmentally friendly products;
- A number of awareness raising workshops were carried out related to PBDE, with support from UNDP;
- Implementation of a 3 R programme at communal scale initiated in 22 provinces, with specific targets on plastic reuse and recycle;
- Formulation of a policy on electronic waste treatment and disposal;
- Private industry investment on the identification of PBDE in plastic waste:

- Development and enforcement of rules for the import of used material;
- Investments in BAT/BEP compliant final disposal for PBDE containing separated waste fractions by regional, municipal and private waste processors;
- Several large cities have ongoing initiatives to support methane gas recovery for energy generation or reduce methane generation through aerobic composting.

Recently, after China banned the import of plastic from abroad, a number of countries, including Indonesia, restricted or forbidden the import of plastic to prevent being flooded with the plastic waste generated by the countries which were previously relying on the Chinese market. Indonesia has currently forbidden the import of plastic waste, however is facing the paradoxical situation of being the second country worldwide for the generation of plastic waste entering the ocean, and at the same time being affected by recycled plastic shortage for their manufacturing industry.

Based on the outcome of the MTR meetings, whilst the manufacturing sector is organized with medium and large scale enterprises, the recycling sector still suffer of being structured in many very small informal recycler, with low technological and financial capacity.

### 3.2. PROBLEMS THAT THE PROJECT SOUGHT TO ADDRESS: THREATS AND BARRIERS TARGETED

The project intends to address a number of barriers which are presently hindering the successful implementation of the baseline projects:

- Limited regulatory framework;
- Insufficient systemic and institutional capacity;
- Professional and Technical limitations;
- Financial Limitations.

In term of Global Environmental Benefits, the project will identify, segregate and dispose in an environmentally sound way up to 1000 tonnes of plastic waste contaminated by PBDE, preventing therefore the release in the environment or entering of these substances in the recycled materials. To achieve the target of 1,000 tonnes PBDE Project will work in three areas (East Java, West Java, and Greater Jakarta).

The project aims to reduce releases of PBDEs and UPOPs by improving overall life-cycle management of plastics and PBDEs-containing plastics through the introduction of alternatives to PBDEs in plastics manufacturing processes and the application of BAT/BEP in plastics recycling and disposal practices.

The project supports Indonesia's plastics industry and recyclers in ensuring that no banned PBDEs are used or recycled into new manufactured articles. In addition, environmentally safe and sound operations of municipal and community waste management will be supported in order to reduce harmful releases of PBDEs and UPOPs. While the core objective of the project is reducing releases of harmful chemicals, it brings additional benefits in terms of socio-economic and climate change, as it has two activity areas that are inherently climate beneficial i.e. increased recycling and material efficiency and better waste management.

The project is structured in the following outputs:

- Project Outcome: To reduce releases of PBDEs and UPOPs by improving overall life-cycle management of plastics and PBDEs-containing plastics through the introduction of alternatives to PBDEs in plastics manufacturing processes and the application of BAT/BEP in plastics recycling and disposal practices.
- Output 1: Strengthening the national policy and regulatory framework to reduce UPOPs and PBDE releases from plastics manufacturing, recycling and disposal practices
- Activity Results 1.1: Reduced PBDEs and UPOPs releases resulting from unsound waste management practices through the adoption and implementation of standards/measures, policies, plans and regulations.
- Output 2: Reducing or eliminating the importation and use of PBDEs in plastics manufacturing
- Activity Result 2.1: Sufficient national technical expertise built to meet challenges with PDBEs in manufacturing and plastic raw material recycling
- Activity Result 2.2: PDBE releases to the environment from the manufacturing sector reduced through phase out and introduction of PBDE avoiding quality control of raw material and awareness raising
- Output 3: Reducing of UPOPs and PDBEs from unsound plastics recycling
- Activity Result 3.1 Reduced releases of PBDEs as a result of improved handling, storage, recycling and disposal of PBDEs containing wastes and products through the introduction of BAT/BAP in the plastics recycling sector.
- Activity Result 3.2 Reduced releases of UPOPs as a result of improved raw material (recycled plastics) supply chains as well as the introduction of environmentally sound disposal practices at recycling entities.
- Output 4: Reducing releases of UPOPs and PBDEs from unsound plastic disposal practices
- Activity Result 4.1: PBDEs and UPOPs releases to the environment reduced through the implementation of appropriate disposal options for hazardous and unrecyclable plastic waste fractions from both formal and informal recyclers and waste collectors.
- Output 5: Monitoring, learning, adaptive feedback, outreach, and evaluation
- Activity Result 5.1: Monitoring and Evaluation and adaptive management applied in response to needs, mid-term evaluation findings with lessons learned extracted.

### 3.3. PROJECT IMPLEMENTATION ARRANGEMENTS: SHORT DESCRIPTION OF THE PROJECT BOARD, KEY IMPLEMENTING PARTNER ARRANGEMENTS, ETC.

See section 4.3.1 "Management Arrangements"

### 3.4. PROJECT TIMING AND MILESTONES

Based on the GEF records, the project approval was signed by the GEF secretariat on Dec 11, 2014. The project document set 1 January 2016 as starting date for the project, and 30 December 2019 as end date.

The project inception workshop only took place on 29 March, 2016. The inception report established as project official start date March 2016, and March 2020 as end date.

### 3.5. MAIN STAKEHOLDERS: SUMMARY LIST

Coordination with the following main stakeholders, as confirmed during MTR mission, was ensured:

- 1) Central government institutions:
  - a. Ministry of Industry
  - b. Ministry of Environment
  - c. Ministry of Finance
  - d. National Planning Agency
- 2) Local governmental institutions:
  - a. Cirebon district
  - b. Mojokerto district
- 3) Private sector and industrial associations:
  - a. Association of plastic industries: Aphindo
  - b. Association of plastic recyclers: Apdupi (small scale) and Adupi (formal, large scale)
  - c. Plastic industries: Interaneka
  - d. Recyclers and waste scavengers
- 4) Local Communities
  - a. Community and Islamic Boarding School in Babakan Village Cirebon,
  - b. Tawang Sari and Kejagan Villages Mojokerto, Depok
- 5) NGOs (as reported by the NPD)
  - a. LohJinawi,
  - b. Wahana Edukasi Harapan Alam Semesta (Wehasta),
  - c. Bank Sampah Mandiri, Paragita,
  - d. My Darling (Sadar Lingkungan),
  - e. Waste4Change,
  - f. Bank Sampah Nusantara Latanza.

## 4. FINDINGS

### 4.1. PROJECT STRATEGY

#### 4.1.1. Project Design

*Review question: Review the problem addressed by the project and the underlying assumptions. Review the effect of any incorrect assumptions or changes to the context to achieving the project results as outlined in the Project Document.*

Based on the project trees (Project Document, page 7) the project intends to address the following problems:

1. Development Challenge: “High use and releases of PBDEs and UPOPs in plastics products, plastics manufacturing processes and plastics recycling and disposal practices”;

2. Immediate causes: *“Manufacturing companies still use PBDEs in their production processes, with the consequence that plastic products that contain PBDEs remain available to the consumers, and lack of segregation of PBDE plastic in the waste recycling stream”.*

The project document identify as root causes the low awareness of public, and the limited understanding (knowledge) by stakeholders on the risk of PBDE and UPOPs to human health and the environment.

The project document identified also the following main barriers to be addressed:

- Limited regulatory framework;
- Insufficient systemic and institutional capacity;
- Professional and Technical limitations;
- Financial limitations.

During the Mid Term Review mission in Indonesia, interviews with representatives of manufacturing industries revealed that c-octa and c-penta PBDEs are not used anymore in plastic industry, and that deca-BDE has been recently replaced by the equivalent Deca-Bromodiphenyl-ethane. On the other side, it is evident that the presence of POP PBDEs in plastic is more a consequence of a lack of control and segregation in the plastic recycling sector rather than of the intentional introduction of this substance in the raw material. Therefore, the initial assumption of high use of PBDEs in production processes seem not anymore valid.

Indeed, the project implementation has since the project inception focused more on the recycling sector than on the manufacturing of plastic, therefore the limited validity of project assumptions (use of PBDE in plastic production) seems having not significantly affected the project outcomes. This was indeed acknowledged at PPG stage: The CEO endorsement request states that, in comparison with the PIF *“Minor revision of the approach introduced, mainly as consequence of putting more emphasis in the recycling stage as compared with plastic manufacturing stage, where less intentional use of PBDE has been found than anticipated. The support towards plastic manufacturing industry remain important but require less GEF support than assessed at PIF stage.”*

*Review question: Review the relevance of the project strategy and assess whether it provides the most effective route towards expected/intended results. Were lessons from other relevant projects properly incorporated into the project design?*

In term of overall strategy, the project document identifies as key issues to be addressed the high release of PBDE and U-POPs from plastic production process and products, as well the lack of application of BAT/BEP in the recycling process (Project Document, Figure 2 “Result Tree). The project objective is therefore *“To reduce releases of PBDEs and UPOPs by improving overall life-cycle management of plastics and PBDEs-containing plastics through the introduction of alternatives to PBDEs in plastics manufacturing processes and the application of BAT/BEP in plastics recycling and disposal practices.”* When this project was initially designed, the amount of PBDE used in

manufacturing was however unknown, and there were no lessons yet from similar projects, so the project design focused on both the production and the recycling side. At Mid Term review, it's however evident that the problem of PBDE releases are more on the side of waste management and recycling than on the side of manufacturing and the implementation is currently mostly focused on waste management activities. The project strategy is still relevant, although the focus has shifted toward recycling activities. This has been indeed confirmed during interviews with all the key project stakeholders

*Review question: Review how the project addresses country priorities. Review country ownership.*

*Was the project concept in line with the national sector development priorities and plans of the country (or of participating countries in the case of multi-country projects)?*

Since the project was designed and submitted (2015), the severity of plastic pollution in Indonesia has become more and more evident. Indonesia ranked as the 2nd country worldwide in term of contribution of marine plastic pollution. The poor collection and recycling capacities do represent a limitation for the plastic industry which has not enough recycled plastic for their production, and is forced to import virgin plastic as the import of plastic waste has been currently halted in Indonesia. This has led to the paradox of industry suffering for plastic shortage whilst sitting in an ocean of plastic. The visit to some plastic recycling sites during the MTR revealed that in these areas, the market pressure for plastic waste has become so important that the economy of plastic recycling replaced agricultural economy (Figure 1). The management of plastic waste, and among them, plastic waste contaminated by PBDE is obviously a high priority for Indonesia. The key project stakeholders (MOEF, MOI, MOF) were involved in project design, and during interviews they confirmed the relevance of the project strategy with country priorities. Interviews with recyclers also confirmed that the objective of the project is relevant, and there are high expectations that some specific project activities may contribute to an improvement of life conditions and reduction of environmental burden. While the deployment of mini-depots to improve the treatment and segregation of plastic waste is considered, by the communities of recyclers, a fundamental project output (see for instance the interview with Ibu Nurul), the improvement and enforcement of the regulatory framework is seen by the institutional stakeholders as the most important goal to be achieved to ensure that PBDE contaminated plastic is properly segregated and disposed and that plastic products are free of PBDE (interviews with). In this regard, the project document lists a number of key facts that have to be considered:



Figure 1. In the Kajagan village, Mojokerto, several farmers shifted from agriculture to plastic recycling. Here, shredded plastic after floating selection drying at the sunlight.

- *“Plastic industry is one of the primary industries in the national development policy 2010-2014. It is estimated to remain one of the primary industries between 2015 and 2019”.*
- *“In total, some 2,000 companies have plastics as their main line of business. In 2011, the plastics industry employed about 350,000 workers”.*
- *“It is estimated that a total of 38.5 million tons of solid waste is generated annually by the 232 million inhabitants in Indonesia (450 gram per person per day), of which 21.2 million tons are on Java”.*
- *“The practice of recycling is still in its infancy due to a lack of supporting infrastructure, leaving the sector mainly in the hands of the informal sector, generally low-income population including women and children, and therefore lacking economies of scale”.*

Based on the above, is therefore obvious that the project concept is in line with the national sector development priorities and plans of the country.

*Review decision-making processes: were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process, taken into account during project design processes?*

Interviews also confirmed that most of the key project stakeholders were involved in project design. More specifically, MOEF and MOI had an active role in the project design since PIF stage. During PIF development – UNDP and MoI invited various stakeholders at national level through the project initiation

plan (PIP) to identify development challenges and develop a PIF that can be agreed together to address the challenges to adhere to the Stockholm Convention on POPs. Based on the discussion, the stakeholders agreed with the idea to address PBDEs and their relevant UPOPs. During PPG stage, UNDP and MoI invited stakeholders at national and sub national level (including associations of industry) to further identify the challenges, assess local needs, situational context, strategy, priority context, etc.

**Project design and gender issues.** The project document states that “*active participation of women and women’s groups will be ensured in order to address the improvement of women’s health and lives. Awareness materials especially tailored for women and vulnerable groups will be prepared to sensitize the health risk of POPs and importance of safe and sound management of Chemicals.*” A gender strategy is included in the project document. Gender-specific tasks with associated indicators are listed in the project logical framework, limited to output 3.1. However, these tasks are rather generic, as they refer mostly to data gathering and to “*capacity building programs that cover the interest of both women and men*”. It seems that the project did not envisage specific actions aimed at directly improving the working conditions of women, which based on the report prepared in the course of project preparation, are significantly worse than those of men. The gender mainstreaming component seems therefore not well integrated in the project document, and the opportunity to better address the condition of women in the plastic recycling industry seems overlooked in the project strategy.

**Summary of considerations on project design.** In general, therefore, the project strategy seems still relevant and flexible enough to implement changes without affecting too much the potential to achieve the final objective. Verification during the MTR however brought to the surface some inconsistencies that need to be resolved through specific amendment of the project document. These are:

- 1) The project is ambiguous concerning the number of mini-depots to be established. In page 22 of the project document, the target is set at 8; however, in the result framework, output 4, the target of mini-depots to be established is set at a maximum number of 6. Nevertheless, UNDP-CO and the PMU believe that the true number of mini-depots to be established is only 3. This aspect has obviously to be clarified.
- 2) The schedule of disposal of plastic waste and its linkage with the availability of the mini-depots: The project document established quite a tight schedule for the disposal of PBDE contaminated plastic, starting from 100 t in the first year up to 1000 t in the last year (output 3.2 in the result framework). Even in this case, a significant discrepancy does exist between the alternative scenario description (page 20, activity 3.2.1 set the target at 50 t/year) and the result framework (from 100 t/yr in the first year up to a total of 1000 t/yr in the fourth year). The establishment of mini-depots and the disposal of PBDE plastic waste are not explicitly linked in the project and this aspect needs to be explicitly reconfirmed.
- 3) Segregation procedures and disposal technologies. The project document is extremely vague on these aspects which are currently the key challenges for the project.

#### 4.1.2. Results Framework/Logframe

The project is articulated in four main outputs, subdivided in “activity results” and “activities” which should be considered equivalent to project components, outcomes and output following GEF standard. There is indeed a certain inconsistency in the description and numbering of outputs and activities between chapter D “Results framework” of the project document, and the project logframe reported in section III “Results and resource framework”. In term of numbering, “Activities results” 2.1, 2.2, 3.1 and 3.2 have been renamed as outputs in the logframe, whilst the associated output 2 and 3 have not been not reported in the logframe. There are discrepancies between the description reported in chapter D “Results framework” and the targets reported in the log frame, for the following activities:

- Output/Activity results 2.1. there are no indicators or targets set for activity 2.1.1. 2.1.1 Detailed data analysis on PBDEs imported, handled and applied in plastics manufacturing. This was reflected in the limited number of analysis (around 500) carried out on plastic samples with the XRF devices.
- Output/Activity results 2.2: the indicators, activities and targets are not aligned. The only indicator for this output concerns “the number of plastic manufacturers having comprehensive raw material checks for PBDE”, whilst the activities envisage “assistance for Quality assurance programmes...”and “communication and awareness raising”. The targets are about “information on the danger of hazardous and toxic PBDEs”, “companies willing to join the programme to reduce and phase out PBDEs”, and “companies having tools for identification of PBDEs”
- Output/activities result 3.1. Among others, under this output the project intends to achieve gender mainstreaming objectives. As already considered in the previous chapter, these tasks are limited to data gathering and to “the selection of companies that cover the interest of both women and men workers”.
- Output/activities result 3.2. The logframe establishes a detailed schedule for segregation and disposal of PBDE containing plastic, from 100t/yr in the first year up a total of 1000 t/yr in the last project year. This is not reflected in chapter D “Results framework” which only set a segregation and disposal target of 50t/yr. However, in the request for CEO endorsement, it was proposed that *“The direct minimum benefit in form of GEB which will be demonstrated through buy-back and disposal scheme will safely dispose some 750 kg of PBDEs contained in some 1,000 metric tons of plastics”*, therefore the reference target is the one indicated in the logframe.
- Output 4. Under this output, the project envisages the establishment of up to 3 mini-depots in the first 3 years of project implementation, and additional 3 mini-depots to be established in the fourth year. This is inconsistent with Chapter D “Result framework”, where the number of mini-depots to be established is set at 8, and is also inconsistent with project implementation schedule which envisages a total number of 3 mini-depots to be established This aspect, together with the amount of plastic diverted from river dumping, has therefore to revised.

As a result of trying to assess the project achievements, it was also found that overlapping does exist among outputs 2.1, 2.2 and 3.1. for what concerns capacity building and implementation of technical guidelines. All the activities on technical guidelines (from development) should have been placed under a single output to facilitate the monitoring and evaluation.

In Annex I, the SMART analysis of the mid-term and end-of-project targets is summarized. The SMART analysis has been based on both the project logical framework and the project description. When a target has been considered compliant with the relevant SMART indicator, it has been set at 1; when not compliant, targets have been set at 0.

In summary, all the targets can be considered relevant and time-bound. Some targets are however not very specific or measurable: for instance, “gaining of information on the implementation of bylaw and standards” (Project Output 1) is a very generic target, difficult to be measured, and in addition is very limited in scope (what are the stakeholders doing with the information they receive?). Instead of “gaining information” it would have been better to propose harder target like “have increased awareness”, or “have increased capacity”, which is at the same time more specific and measurable. Another not very specific target concerns the implementation of capacity building program which “covers the interest of both women and men”. In this case what is indeed important is to ensure the participation of both women and men in the capacity building program, which means active participation (measurable through their presence and intervention in workshops, training etc.), and also ensure that the project promote equal opportunities and treatment in the workplace. Some of the targets, although time bound, are not reasonably achievable within the assigned timeframe, which means that either the targets have to be reconsidered or the project deadline has to be extended. More specifically, this concerns the targets listed under output 3.2 (amount of metric tons of PBDE containing plastic separated and safely disposed) and the targets listed under output 4 (number of mini-depots to be established and amount of plastic to be diverted from river dumping).

*Review question: Examine if progress so far has led to or could in the future catalyse beneficial development effects (i.e. income generation, gender equality and women’s empowerment, improved governance etc...) that should be included in the project results framework and monitored on an annual basis.*

Once equipment for better segregation in mini-depots have been installed and functional, it is likely that the project could generate some income deriving from the increased value of the recycled plastic compared to the status quo. Currently this potential additional income is not among the parameters subjected to monitoring, and should be included in the list of indicators. However, considering that the project is late on the development of the mini-depots, it is likely that this additional income will materialize only in the last year of project implementation, or after project end.

Review question: Ensure broader development and gender aspects of the project are being monitored effectively. Develop and recommend SMART 'development' indicators, including sex-disaggregated indicators that capture development benefits.

Specific indicators should be introduced to verify equal access to men and women to job opportunities, training opportunities and access to information. These indicators are currently missing in the logical framework and should be introduced. Lack of specific and measurable indicators in gender mainstreaming resulted in reduced impact of the project on this aspect.

Intended Outputs	Output Targets	Specific	Measurable	Attainable	Relevant	Time-bound	Notes / comments	
<p><b>Output 1: Strengthening the national policy and regulatory framework to reduce UPOPs and PBDE releases from plastics manufacturing, recycling and disposal practices</b></p> <p><b>Indicators:</b>            Technical by-laws and guidelines on PBDE handling and management.            National standard on maximum PBDE concentration in products.            Functioning Extended Producer Responsibility (EPR) scheme for PBDE containing product groups.</p> <p><b>Baseline:</b>            No technical by-laws and guidelines on PBDE handling and management.            No national standard on the maximum use of PBDEs in a product.            No EPR scheme for PBDE containing product groups.</p>	<p><b>A specific technical by laws that contains the standard on PBDE handling and management is established, disseminated and adopted.</b></p> <p><b>Year 1:</b>            A draft of specific technical by laws on PBDE handling and management is developed.            A draft of specific national standard on the maximum PBDE concentration in products is developed            A draft of EPR is developed.</p> <p><b>Year 2:</b>            A specific technical by laws on PBDE handling and management is established.            A specific national standard on the maximum PBDE concentration in products is established.            3 associations and 3 companies are consulted concerning the draft of EPR.</p> <p><b>Year 3:</b>            3 associations and 3 companies gain information regarding the dissemination on specific technical by laws.            3 associations and 3 companies gain information regarding the standard on the maximum PBDE concentration in products.            3 more companies are consulted regarding the draft of EPR.</p> <p><b>Year 4:</b>            3 local government agencies, 3 community-based organizations (CBOs)/ non-government organizations (NGOs), and 3 more companies located in 3 provinces gain</p>							
		1	1	1	1	1		
		1	1	1	1	1		
		1	1	1	1	1		
		1	1	0	1	1		Establishment of a bylaw within the project timeline is challenging and almost impossible within the first 2 years
		1	1	0	1	1		
		1	1	1	1	1		
		0	0	1	1	1		The target of "gaining information" is very generic and not obviously measurable
		0	0	1	1	1		
		0	1	1	1	1		
		0	0	1	1	1	The target of "gaining information" is very generic and not obviously measurable	

Intended Outputs	Output Targets	Specific	Measurable	Attainable	Relevant	Time-bound	Notes / comments
	<p>information concerning the implementation of specific technical by laws on PBDE handling and management.</p> <p>3 local government agencies, 3 CBOs/ NGOs and 3 more companies gain information regarding the implementation of the national standard on the maximum use of PBDE in products.</p> <p>3 local government agencies, 3 community-based organizations (CBOs)/ non-government organizations (NGOs), and 3 more companies located in 3 provinces gain information regarding the implementation of EPR.</p>	0	0	1	1	1	<p>The target of "gaining information" is very generic and not obviously measurable</p> <p>The target of "gaining information" is very generic and not obviously measurable</p>
<p><b>Output 2.1: Sufficient national technical expertise built to meet challenges with PBDEs in manufacturing and plastic raw material recycling.</b></p> <p><b>Indicators:</b> Number of technical guidelines on the plastic production and recycling are developed</p> <p><b>Baseline:</b> No technical guidelines on the plastic production and recycling</p>	<p><b>Technical guidelines and standard on the plastic production and recycling.</b></p> <p><b>Year 1</b> A draft of technical guidelines and standard on the plastic production and recycling is developed.</p> <p><b>Year 2</b> A technical guideline and standard on the plastics production and recycling is established.</p> <p><b>Year 3</b> 3 associations of plastic manufacturing companies, 3 plastic manufacturing companies, and 2 plastic recycling companies gain information regarding the technical guidelines and standard on the plastic production and recycling.</p> <p><b>Year 4</b> 3 more plastic manufacturing companies and 2 plastic recycling companies receive information regarding the technical guidelines and standard of the plastic production and recycling.</p>	1	1	1	1	1	<p>The target of "gaining information" is very generic and not obviously measurable</p> <p>The target of "gaining information" is very generic and not obviously measurable</p>
<p><b>Output 2.2:</b> PBDE releases to the environment from the manufacturing sector reduced through phase out and introduction of PBDE avoiding quality control of raw material and awareness raising.</p> <p><b>Indicators:</b> Number of plastic manufacturers have comprehensive raw material checks for PBDEs.</p>	<p>Plastic manufacturers have capacity to identify PBDE in their raw materials for production process and consider alternative substances.</p> <p><b>Year 1</b> Three plastic manufacturers gain information on the danger of hazardous and toxic PBDEs and UPOPs through the implementation of</p>	0	1	1	1	1	<p>"Gaining information" is a generic and not very effective target</p>

Intended Outputs	Output Targets	Specific	Measurable	Attainable	Relevant	Time-bound	Notes / comments
<b>Baseline:</b> No checking has been undertaken to identify PBDEs in both virgin and recycled, raw materials.	workshops in Bekasi, Surabaya and Bandung.						Willingness to join is not easily measurable. Tools to identify PBDEs is not a guarantee that these tools will be indeed used.
	<b>Year 2</b> Three more plastic manufacturers gain information on the danger of hazardous and toxic PBDEs and UPOPs.	0	0	1	1	1	
	<b>Year 3</b> Three more selected companies are willing to join the programme to reduce and phase-out PBDEs in their production process.	0	0	1	1	1	
	<b>Year 4</b> Three more selected companies have tools to identify PBDEs.	0	0	1	1	1	
<b>Output 3.1:</b> Reduced releases of PBDEs as a result of improved handling, storage, recycling and disposal of PBDEs containing wastes and products through the introduction of BAT/BAP in the plastics recycling sector.	Plastic recycling sector has capacity to identify and improve technical practices in handling, storing, recycling and disposing PBDEs containing wastes.						This target is quite generic and somehow misleading, as "the interest of women and men workers" should be better specified  How to measure the "willingness to join"? Moreover, this target is quite generic and somehow misleading, as "the interest of women and men workers" should be better specified  How to measure the "willingness to join"?
<b>Indicator:</b> Gender disaggregated data on recyclers. Number of plastic recyclers whose capacity to identify PBDEs and process plastic waste to BAT/BEP is increased. Rudimentary techniques for plastic processing applied in plastic recycling clusters.	<b>Year 1</b> A gender segregated data on recyclers is collected.	1	1	1	1	1	
	Three recycling companies are trained to understand the danger of hazardous and toxic PBDEs.	1	1	1	1	1	
	A draft of technical guideline (BAT/BEP) for recycling sector is prepared.	1	1	1	1	1	
	<b>Year 2</b> 3 capacity building programs that cover the interest of both women and men workers are undertaken.	0	0	1	1	1	
	3 more recycling companies gain understanding on the danger of hazardous and toxic PBDEs.	0	0	1	1	1	
	A technical guideline (BAT/BEP) for recycling sector is established.	0	0	0	1	1	
	<b>Year 3</b> 3 more selected companies that cover the interest of both women and men workers are willing to join the programme to reduce and phase-out PBDEs in their recycling practices.	0	0	1	1	1	
	3 selected companies have tools to identify PBDEs and dispose PBDEs containing goods.	1	1	1	1	1	
	The established technical guideline is integrated into 3 plastic recycling practices.	1	1	1	1	1	
	<b>Year 4</b> 3 more selected companies that cover the interest of both women and men workers are willing to join the	0	0	1	1	1	

Intended Outputs	Output Targets	Specific	Measurable	Attainable	Relevant	Time-bound	Notes / comments
	<p>programme to reduce and phase-out PBDEs in their recycling practices.</p> <p>3 more selected companies have tools to identify PBDEs and willingness to dispose PBDEs containing goods.</p> <p>The established technical guideline is integrated into 3 more plastic recycling practices.</p>	1	1	1	1	1	Moreover, this target is quite generic and somehow misleading, as "the interest of women and men workers" should be better specified
<p><b>Output 3.2:</b> Reduced releases of UPOPs as a result of improved raw material (recycled plastics) supply chains as well as the introduction of environmentally sound disposal practices at recycling entities.</p> <p><b>Indicator:</b> Tonnage of PBDE containing plastics separated and safely disposed.</p> <p>Technical guidelines to separate PBDE containing plastics.</p> <p><b>Baseline:</b> No data on PBDE containing plastics.</p> <p>Technical guidelines to separate PBDE containing plastics.</p>	<p>Plastic recycling sector has capacity to identify and improve technical practices in addressing UPOPs.</p> <p><b>Year 1</b> 100 metric tons of PBDE containing plastic waste are separated and safely disposed. A draft of technical guidelines to eliminate UPOPs is prepared.</p> <p><b>Year 2</b> 500 metric tons of PBDE containing plastics waste are separated and safely disposed. A technical guideline is established.</p> <p><b>Year 3</b> 800 metric tons of PBDE containing plastics are separated and safely disposed. The technical guideline is integrated into 3 plastic recycling practices.</p> <p><b>Year 4</b> 1,000 metric tons of PBDE containing plastics waste are separated and safely disposed. The established technical guideline is integrated into 3 more plastic recycling practices.</p>	1	1	0	1	1	<p>Not reasonable to start any disposal activity within the first year of implementation Not "eliminate" UPOPs but "reduce UPOPs releases"</p> <p>Very challenging to achieve disposal target within the first two years of implementation</p>
<p><b>Output 4: PBDEs and UPOPs releases to the environment reduced through the implementation of appropriate disposal options for hazardous and unrecyclable plastic waste fractions from both formal and informal recyclers and waste collectors.</b></p> <p><b>Indicator:</b> Number of mini-depots for waste separation established at communities.</p> <p>Tonnage of waste diverted from river dumping.</p> <p>Additional tonnage of MSW undergoing sanitary landfilling</p>	<p><b>Disposal options for hazardous and unrecyclable plastics waste fractions from both formal and informal recyclers and waste collectors are established and implemented.</b></p> <p><b>Year 1</b> 1 mini depo is prepared for waste separation at community.</p> <p>1 ton/week of plastic waste diverted from river dumping in East Java.</p> <p>1 ton/week of waste diverted from river dumping in West Java.</p>	1	1	0	1	1	<p>Not reasonable to achieve this target within the first year of project implementation Measurement of this target implies the establishment of a specific organization which is</p>

Intended Outputs	Output Targets	Specific	Measurable	Attainable	Relevant	Time-bound	Notes / comments
and waste to energy treatment in Surabaya and Bandung. <b>Baseline:</b> Limited number of demonstrated mini-depots in urban areas.	<b>Year 2</b> 2 mini-depots are prepared and technical guideline is established.	1	1	0	1	1	not reflected in the project document  Very challenging to achieve this target within the first two years of project implementation
10 tons/week of waste is dumped in Surabaya River. About 3 tons is dumped in Cikapundung River weekly. Bandung has more than 1,000 tons a day of waste is being landfilled. 750 tons/day is not collected. Surabaya generates 2,400 tons MSW. 1,200 tons/day landfilled.	4 tons/week of plastic waste diverted from river dumping in East Java.	1	0	0	1	1	Measurement of this target implies the establishment of a specific organization which is not reflected in the project document
	4 tons/week of plastic waste diverted from river dumping in West Java.	1	0	0	1	1	
	<b>Year 3</b> 3 mini-depots are established in selected areas.	1	1	1	1	1	Measurement of this target implies the establishment of a specific organization which is not reflected in the project document
	6 tons/week of plastic waste diverted from river dumping in East Java.	1	0	0	1	1	
	6 tons/week of plastic waste diverted from river dumping in West Java.	1	0	0	1	1	
	<b>Year 4</b> Additional 3 mini-depots are functioned.	1	1	0	1	1	There is inconsistency between the project document and this target. The building of additional 3 mini-depots is not achievable
8 tons/week of plastic waste diverted from river dumping in East Java.	1	0	0	1	1	Measurement of this target implies the establishment of a specific organization which is not reflected in the project document	
8 tons/week of plastic waste diverted from river dumping in West Java.	1	0	0	1	1		

## 4.2. PROGRESS TOWARDS RESULTS

### 4.2.1. Progress towards outcomes analysis

In the following tables (Table 2 to Table 7), the summary of project achievements in comparison with the relevant target and indicators is reported.

The analysis of the progress toward results revealed the following:

Under Output 1, drafts on several laws were prepared under the project. The technical draft on PBDE handling and management was developed and underwent review process by the Ministry of Industry, plastic industries and recycling industries in 2018.

The draft on Indonesia National Standard (SNI) for Plasticized Polyvinyl Chloride (UPVC) product was being developed as well in 2017. It is the first national standard on maximum PBDE content in plastic product published in 2018 under the serial of 8454:1027 for UPVC product.

A Draft on Extended Producer Responsibility (EPR) scheme for potentially PBDEs/UPOPs releasing product was developed in 2017 to encourage greener product design. In 2018, it went under finalization and piloting in 2 sites (in West Java and East Java)

The Draft of Ministry's Decree on monitoring and controlling PBDEs and PBDE containing products to support the regulation has been drafted in 2018 and is under review by Customs Agency, Ministry of Trade, Ministry of Industry and Ministry of Environment and Forestry.

A draft for national standard for power banks was developed in 2018. An academic draft and a report were prepared in mid-2018 for the PBDE content in power banks.

A draft on regulation on controlling the use of PBDE and other dangerous chemicals listed under the Stockholm Convention is prepared as revision of PP 74 of 2001 on Hazardous and Toxic Substance Management and led by the Ministry of Environment and Forestry (MoEF) and supported by Ministry of Industry (Mol) along with other related ministries. This effort has taken at least 2 (two) years, but still has not reached any conclusion because of the different perspectives of the two Ministries. Mol as a stakeholder of the Governmental Regulation thinks that MoEF have to only concentrate on Annex A of Stockholm Convention and not include other substances from other conventions (Basel and/or Rotterdam). On the other hand, MoEF still thinks that this Governmental Regulation needs to adhere to Stockholm and the 2 additional conventions, hence the discussed substances included in the Governmental Regulation are still yet to be decided and concluded. In any case, as pointed out by the project management, PP 74 of 2001 is currently in the hand of Coordinating Ministry of Law and Human Rights. PBDE & UPOPs project can only follow the procedures, which is conducted by the government

In order for a revision of a Governmental Regulation to be approved, (although only the Annex is revised), the initiating ministry –in this case MOEF has to submit the agreed revised draft of the Governmental Regulation to the Ministry of Law and Human Rights.

Submission for the revision does not need a presidential approval, but the reasoning of the revision submission has to be mentioned and approved by the coordination meeting between Ministries coordinated by the Ministry of Law and Human Rights.

From the substantial standpoint, based on the discussion and examination with the regulatory expert, in charge of development of the regulation, the draft regulation on technical standards contain indications to proposed the continued use of PBDE up to 2030. This proposal extension seems unnecessary as, through talkings with the industrial associations and industries, (Annex 6.5) it has been understood that the use of PBDE has been already ceased in the plastic industries, and replaced by

one of the alternative to PBDE which is listed under the Stockholm Convention webpage<sup>1</sup>, and particularly the Decabromodiphenyl ethane (DBDPE). In addition, Indonesia did not apply for any exemption for deca-BDE or others POP BDEs Therefore at this stage the requirement of delay for the application of the SC requirements seems at least not fully supported by the Indonesian government. The proposed target of 1000 ppm of BDE, which has been established and endorsed under the SNI, is in line with the international standards for this substance (for instance, the European ROHS<sup>2</sup> directive, or the item 67 of the Annex XVII to the REACH Directive<sup>3</sup>) and with the Stockholm Convention.

Beside the substantial aspects, an analysis of possible enacting modalities of the regulation on PBDE has been carried out by the national reviewer<sup>4</sup> Three options have been identified:

- Amendment and Revisions of Current Regulations, Prioritizing Governmental Regulation on PBDE;
- Sectoral Ministry by-law in the Ministries
- Option to Incorporate PBDE into the Regional Regulation

The analysis evidenced that all the above options are feasible, but in all cases extensive time is needed. The project only have eight months to wrap up its activities, and this time constrain hinders all opportunities to establish preparation for any technical by-law. Moreover, there is still a high probability that the Project will not be able to achieve the enacting of a technical by-law for PBDE: it is indeed out of the control of the project to enact anything under Indonesian Law. In this sense, it could be wise to amend the project framework in the sense of establishing as target only to provide a draft technical by-law on PBDE's elimination and ban to the Mol.

Concerning Output 2.1, and Output 2.2, a set of technical guideline documents and trainings have been delivered. The technical guidelines<sup>5</sup> include procedures and equipment for the identification of PBDE containing plastic (portable equipment like XRF and sliding spark technologies, as well as sink and float); procedures for manual dismantling of E-waste; emission control. The training was developed through classroom lessons, try-out lessons, focus group discussion (FGD), videos, addressed to both manufacturers of plastic components and recyclers. Based on the report, dissemination of information

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<http://chm.pops.int/Implementation/Alternatives/AlternativestoPOPs/ChemicalslistedinAnnexA/cdecaBDE/tabid/5985/Default.aspx>

<sup>2</sup> Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

<sup>3</sup> Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

<sup>4</sup> A LEGAL ANALYSIS ON REGULATING PBDE IN INDONESIA for Reducing Releases of Polybromodiphenyl Ethers (PBDE) and Unintentional Persistent Organic Pollutants (UPOPs) Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia. UNDP INDONESIA. Linda Yanti Sulistiawati April 2019

<sup>5</sup> Development Technical Guideline (BAT/BEP) and Training Module to Improve in Handling, Storing, Recycling and Disposing of PBDE's Containing Waste in the Plastic Recycling Sector. February 2019, AMC consulting

of BAT and the project has been performed on 17.1.2019 in Bekasi, West Java and on 18.1.2019 in Mojokerto East Java. 52 persons participated in West Java and 35 persons in East Java in the event, in total 87 persons. Based on figures provided by the NPD, awareness raising events were carried out in 16 locations, attended by 1,380 female participants and by 1,539 male participants. The final report contains also a number of recommendations for the government, among which one is *“Establishment of one or more pilot plant(s) to separate PBDE containing plastic. This could also include technologies to separate plastic types to improve quality of recycled plastic in Indonesia. The results should be shared with the recycling companies. The separation methods should be: XRF, SSS, and sink and float, for separation of plastic types an IR device could be purchased”*.

On the side of manufacturers, two trainings on “Identification and handling of the flame retardant PBDE in EEE producing companies” for EEE companies have been conducted. One training was performed in West Java and one in East Java. The Training in West Java has been conducted from 10. to 12.12.2018 in Hotel Harris (four star) and the training in East Java was performed on 17. to 19.12.2018 in Hotel Harris in Surabaya (four stars). The final report includes recommendations for the government, among which one of the most important is to *“gather data on current use of PBDE in electrical and electronic products in Indonesia”*.

Concerning this output, although the guidelines for plastic recycler and manufacturer have been delivered, the observed impact is still limited. Through site visits carried out by the reviewees in Mojokerto recycling villages, it was evident that limited practical actions –on the side of adoption of proper Personal Protective Equipment, segregation practices or sound disposal of PBDE contaminated plastic – were adopted (See Annex 6.5, minutes concerning the visit in Mojokerto on 15/03/2019) This can be only partially explained with the fact that the mini-depo in the Mojokerto area has still to be delivered<sup>6</sup>. On this aspect, the report prepared by AMC<sup>7</sup> states that *“The second visit showed that the recyclers are reluctant to implement such measures. Only one company had implemented a measure to tackle these PBDE issues: they changed to using PPE. The main reason is that for them no financial (or other) benefit exist. In fact, these measures add cost to their recycling process: losses of material (the part with PBDE), investment for XRF or SSS or additional sink and float activity, manpower cost for these process, cost of transport, and cost for burning in cement kiln.”* What is mentioned by the AMC report has indeed to do with incremental costs which have to be covered by the project. The expectation is that these incremental costs could be covered through the operation of equipment to be installed at the mini-depots. However, the timing for procurement, designing and building the mini-depots proved to be too long to provide a timely solution for the recyclers. It is evident that, if segregation and adoption of safe measures on the plastic recycling side are not coupled with an increased income which could

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<sup>6</sup> As from information of the project management dated 29/05/2019, the mini depot in Mojokerto has been cancelled due to delay in providing the necessary legal documents.

<sup>7</sup> Development Technical Guideline (BAT/BEP) and Training Module to Improve in Handling, Storing, Recycling and Disposing of PBDE's Containing Waste in the Plastic Recycling Sector, page 50 (AMC, February 2019)

derive, for instance, by a facilitated access to the market, a higher value of the processed waste, or both, these measures are not going to be adopted. At the same time, a financial mechanism for the safe disposal of non-recyclable plastic (for instance through agreements with suitable cement kiln factories) is needed to ensure that the current practice of disposal of these waste through brick factories (equivalent to burning in the open) is dismissed. The project should have covered disposal cost in the amount of 800 tons of plastic for the first 3 years, but so far, no PBDE contaminated plastic has been segregated and disposed, therefore the benefit for the recycler did not materialize and they continued to dispose unrecyclable waste in an unsafe way.

Concerning Output 3.1 (Table 5), an analysis report was delivered and a survey on the situation on gender mainstreaming in the plastic recycling sector carried out. The project conducted a study based on gender and livelihood of female and male workers in the plastics and electronic waste recycling sector. This study was done by involving 46 women and 72 men plastics recycle workers from several formal and informal recycling industries across West and East Java, specifically in Bekasi, Depok, Cianjur, Bandung, and Jombang Regions.

The study found that most plastics and electronic waste recycling industries are informal small and medium scale home industries which often employ informal workers. They work in the waste processing in the manual way, mostly in the residential neighbourhood. While women workers are generally older than the male worker, they came from similar background of having low education level. Female workers aged over 50 years dominated this industry (48%-50%) as they do not have other work choices because of their age, education level, and minimum skills.

Based on study and confirmed during the field visit (See Annex 6.5, minutes concerning the visit in Mojokerto on 15/03/2019) , it was found that this industry applies different rules for female and male workers, depending on the focus of waste processing activities. Many female workers are involved in various tasks starting from scavenging, waste sorting, disassembling, rough chopping, to waste rinsing before and after milling whereas male workers do tasks that require physical strength and tasks that are run using simple technologies such as lifting items and operating milling machines. Such distinction has an impact on the amount of wage. Based on the study, In East Java, the male workers generally earn IDR 1,000,000 to IDR 1,500,000 in a month, compared to the female workers who earn IDR 500,000 to IDR 1,000,000 per month. This condition is worse in West Java where the male workers generally earn around IDR 1,000,000 to IDR 1,500,000 while female worker get less than 500,000 per month on average.

Formally, the project achieved what was established by the project indicators and targets. However, if from one side the data gathering, and surveys carried out contributed to bring to the surface a situation of disparity among men and women in the plastic recycling sector, from another side this did not result in practical actions, either from the government or operators, to implement policies aimed at reducing such disparity. This is also due to the fact that the indicators related to gender mainstreaming set in the project, as already pointed out in the analysis of the result framework, are too generic and weak.

Output 3.1 (Table 5) instead contains a clear requirement on the technical guidelines “to be integrated into 3 plastic recycling practices (target for the year 3). As already explained, this target has not achieved as either from the site visits and from the final reports from the consultant, it is evident that the operation modalities of the recycler remained basically unchanged.

Concerning the target on disposal of plastic potentially contaminated by PBDE (output 3.2, Table 6) it is evident that the project is late on this aspect. So far, no PBDE contaminated waste have been identified (although, from the site visits, it was evident that significant amount of “heavy” plastic which could be PBDE contaminated are usually set aside; this plastic is currently being incinerated in brick small scale factories (a procedure equivalent to open burning), however no attempt to track the amount of that plastic or measure its content of PBDE has been undertaken. Even on this side it seems that the selected approach has been to postpone all these activities to the establishment of the mini-depots, whilst many preparatory activities (for instance, identification, analysis and storage of the unrecyclable plastic) should have been undertaken with project resources, pending an agreement with existing cement kilns factories (agreement which should also include a burning test and the measurement of POPs released). Indeed, even in the absence of the mini-depo infrastructures, a number of activities should be anticipated to ensure that the project can fulfil this target. For instance, XRF equipment for measuring brominated compounds in plastic have been delivered; they were used for measuring BFR in around 500 plastic samples, but could be used to carry out a much wider and systematic analytical activity to measure the content of BFR on the different plastic streams processed by the recycling community in Mojokerto or other project sites.

On May 29, the reviewers were informed that the mini depot construction plan in Mojokerto had to be cancelled: *“For your information we have to cancel mini depo construction plan in Mojokerto because the local government cannot provide legal documents to build mini depo until deadline, April 2019. Therefore we moved mini depo plan to Malang, East Java. Local government already provided a building to be used as mini depo and project will furnish with equipment. We have received legal document of commitment from the local government. We have conducted meeting on 28 May 2019 with NPD and NPD agreed the mini depo plan in Malang.”*

Although this new situation can speed up the project delivery of mini depots infrastructures, the change could represent an issue for the local population of the Mojokerto area which received already a lot of training on segregation and disposal of plastic waste and were waiting for the establishment of the mini depot to implement the training received.

On the side of plastic waste disposal, formal talking with cement industry started very recently with a meeting at Indocement in Cirebon on 5 April 2019. The plant can however only receive shredded plastic waste and then on 8 May 2019 the project conducted meeting with the Head of Environmental Office Depok accompanied by her staff and the manager of Depok Central Waste Bank. The project offered to handle the collecting, shredding and transporting to cement industry.

The reviewers were informed that on 24 May 2019 a project delegation visited PT. Solusi Bangun Indonesia (PT. SBI/Holcim) and had a meeting with the Country Manager GeoCycle Indonesia, who explained that PT. SBI, through Geocycle (AFR Division), has utilized plastic waste from electronics by co-processing method, as alternative fuel for cement production since 2006. PT. SBI can receive both bulk and shredded plastic waste and has 3 storage of bulk waste with total capacity 2,100 tons. The plant has established a waste management system and is equipped with an accredited laboratory to ensure compliance with the environmental regulations. The laboratory has the capacity to regularly analyse emission: dust, SO<sub>2</sub>, NO<sub>x</sub>, NH<sub>3</sub>, HCl, HF, heavy metal (every 3 months), and dioxin (annually).

This agreement, which should anyway be formalized through the relevant procurement procedures; can solve one of the most serious project difficulties. In any case it is evident that the project is late on the disposal of PBDE containing plastic. The target will not be achieved within project deadline, and could be achieved if the project deadline is postponed only if the actions for the identification and segregation of plastic waste are anticipated and de-coupled from the development of the mini-depots.

As far as the development of the mini-depots is concerned (Output 4, Table 7), the project management shared a timeline for the instalment of the second mini-depots (Depok) which span until March 2020, with procurement activities to be concluded in May 2019. The time schedule seems quite tight, however even if fulfilled, this means that the second mini-depots will be not operational before a year. The infrastructure of the first mini-depots have been already completed, however the equipment is still under procurement. It seems therefore that 2 mini-depots could be operational within a year. It should be noted that the mini-depots would not cover the entire amount of plastic waste processed in the relevant areas. For instance, in the case of Mojokerto (plan which has been subsequently replaced by the Malang deposit), the mini-depo would process up to 10% of the plastic waste. Therefore, is necessary to decouple segregation and disposal activities from the development of mini-depots, because that will be the reality of facts. The project document envisages the development and operation of a total number of 6 mini-depots. As already mentioned, there is a discrepancy within project document as the target is set at 6 in the logical framework and 8 in the textual description of project activities. After discussion with the project management team, it has been explained that only 3 mini-depots will be developed.

In summary, it may be affirmed that so far, on the side of development of draft legislation, preparation and communication of guideline documents, the project is in line with the schedule. Training of recyclers and manufacturers have been completed, although the impact of these actions was limited; the project is late on the side of development of waste management infrastructures (mini-depots), out of which only 2 will be operational by the end of the 4<sup>th</sup> year of the project; very limited progress have been achieved concerning PBDE plastic segregation and disposal and the project is at risk of not achieving this target.

Table 2: Summary of progresses for Output 1.

<b>Output 1: strengthening the national policy and regulatory framework to reduce U-POPS and PBDE releases from plastics manufacturing, recycling and disposal practices.</b>	<b>Achievement rating</b>
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Year	Relevant Targets	Achievements	
1	A draft of specific technical by laws on PBDE handling and management is developed. A draft of specific national standard on the maximum PBDE concentration in products is developed A draft of EPR is developed.	Available reports: <ul style="list-style-type: none"> <li>Regulatory impact analysis of the proposed technical standard</li> <li>Extended producer responsibility for Electric and electronic equipment.</li> <li>Draft regulation on technical standards.</li> <li>The technical draft on PBDE handling and management.</li> </ul>	
2	A specific technical by laws on PBDE handling and management is established. A specific national standard on the maximum PBDE concentration in products is established.	<ul style="list-style-type: none"> <li>The draft on Indonesia National Standard (SNI) for Plasticized Polyvinyl Chloride (UPVC) product was being developed AND published in 2018 under the serial of 8454:1027 for UPVC product.</li> </ul>	
3	3 associations and 3 companies are consulted concerning the draft of EPR. 3 associations and 3 companies gain information regarding the dissemination on specific technical by laws. 3 associations and 3 companies gain information regarding the standard on the maximum PBDE concentration in products. 3 more companies are consulted regarding the draft of EPR.	<ul style="list-style-type: none"> <li>Draft on Extended Producer Responsibility (EPR) scheme for potentially PBDEs/UPOPs releasing product</li> <li>Draft on regulation on controlling the use of PBDE and other dangerous chemicals that were managed by the Stockholm Convention.</li> <li>Draft of Ministry's Decree on monitoring and controlling PBDEs and PBDE containing products</li> <li>The draft for national standard for power banks was developed in 2018</li> </ul> <p>The draft regulation on technical standard propose the continued use of PBDE in existing industries up to 2030, however there is no reason for that, as Indonesia did not apply for any exemption. More discussion on that is needed.</p> <p>The SNI is available and endorsed. It does contain a proposed target of 1000 ppm which is in line with the Stockholm Convention</p>	

Table 3: Summary of progresses for Output 2.1.

<b>Output 2.1: Sufficient national technical expertise built to meet challenges with PBDEs in manufacturing and plastic raw material recycling.</b>			<b>Achievement rating</b>
Year	Relevant Targets	Achievements	
1	A draft of technical guidelines and standard on the plastic production and recycling is developed.	Available documents. Technical Guideline (BAT/BEP) and Training Module to Improve in Handling, Storing, Recycling and Disposing of PBDE's Containing Waste in the Plastic Recycling Sector, AMC, February 2019	
2	A technical guideline and standard on the plastics production and recycling is established.	Reports on Training Modules for recyclers The technical guideline has been prepared by AMC	
3	3 associations of plastic manufacturing companies, 3 plastic manufacturing companies, and 2 plastic recycling companies gain information regarding the technical guidelines and standard on	Training for plastic recycling company delivered.	

the plastic production and recycling.

Both guidelines and training have been developed for recyclers and manufacturers.



Table 4: Summary of progresses for Output 2.2.

**Output 2.2.: PBDE releases to the environment from the manufacturing sector reduced through phase-out and introduction of PBDE avoiding quality control of raw material and awareness raising.**

Year	Relevant Targets	Achievements
1	Three plastic manufacturers gain information on the danger of hazardous and toxic PBDEs and UPOPs through the implementation of workshops in Bekasi, Surabaya and Bandung.	Available documents: Reports on PBDE Training Module for Manufacture Industry 01.2019 Guidance documents and training for EE manufacturers have been developed.
2	Three more plastic manufacturers gain information on the danger of hazardous and toxic PBDEs and UPOPs.	Guidance document, try out sessions and training delivered, however the impact is limited as limited changes was observed on the recycling practices.
3	Three more selected companies are willing to join the programme to reduce and phase-out PBDEs in their production process.	



Table 5: Summary of progresses for Output 3.1.

**Output 3.1: Reduced releases of PBDEs as a result of improved handling, storage, recycling and disposal of PBDEs containing wastes and products through the introduction of BAT/BAP in the plastics recycling sector.**

Year	Relevant Targets	Achievements
1	A gender disaggregated data on recyclers is collected. Three recycling companies are trained to understand the danger of hazardous and toxic PBDEs. A draft of technical guideline (BAT/BEP) for recycling sector is prepared.	Reports: <ul style="list-style-type: none"> <li>Aspect of Life Of Recycling Workers Of Plastic Waste And Electronic Waste In Some Cities Of Jawa Timur And West Java - (Gender Analysis of the Plastic and Electronic Waste Recycling Sector Which Contains Hazardous Chemicals.</li> <li>Gender Analysis and Community Life Babakan Ciwaringin Village, Cirebon Regency</li> <li>Gender Baseline data in East Java side</li> </ul>
2	3 capacity building programs that cover the interest of both women and men workers are undertaken. 3 more recycling companies gain understanding on the danger of hazardous and toxic PBDEs. A technical guideline (BAT/BEP) for recycling sector is established	Training for recycling company has been delivered. Although the training in selected companies has been performed, the companies are reluctant to implement best environmental practices and health protection measures. Recyclers are not yet identifying PBDEs and disposing PBDEs containing materials. The technical guideline is not integrated in the plastic recycling practices
3	3 more selected companies that cover the interest of both women and men workers are willing to join the programme to reduce and phase-out PBDEs in their recycling practices.	



3 selected companies have tools to identify PBDEs and dispose PBDEs containing goods.  
The established technical guideline is integrated into 3 plastic recycling practices.

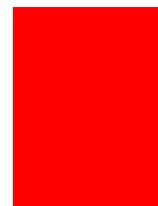


Table 6: Summary of progresses for Output 3.2.

<b>Output 3.2: Reduced releases of UPOPs as a result of improved raw material (recycled plastics) supply chains as well as the introduction of environmentally sound disposal</b>		
<b>Year</b>	<b>Relevant Targets</b>	<b>Achievements</b>
<b>1</b>	100 metric tons of PBDE containing plastic waste are separated and safely disposed. A draft of technical guidelines to eliminate UPOPs is prepared.	No PBDE contaminated plastic has been segregated or disposed so far. The discussion on the disposal technology to be adopted started very recently (April 2019), although it has been found that some E-waste recyclers already send the shredded plastic waste to cement kilns for final disposal, therefore incineration in cement kiln seems a viable option. The identification of PBDE containing plastic is an issue, complicated by the fact that the XRF equipment was used only for a small amount of samples in the lab. Some of the recyclers currently adopt very rudimentary method for the identification of different type of plastic, some of which (sink and float) can be possibly improved to identify PBDE contaminated plastic. <b>There is the substantial risk that the disposal target of 1000 tons of PBDE contaminated plastic would not be achieved by the end of the project.</b>
<b>2</b>	500 metric tons of PBDE containing plastics waste are separated and safely disposed. A technical guideline is established.	
<b>3</b>	800 metric tons of PBDE containing plastics are separated and safely disposed. The technical guideline is integrated into 3 plastic recycling practices.	



Table 7: Summary of progresses for Output 4.

<b>Output 4: PBDEs and UPOPs releases to the environment reduced through the implementation of appropriate disposal options for hazardous and unrecyclable plastic waste fractions from both formal and informal recyclers and waste collectors.</b>		
<b>Year</b>	<b>Relevant Targets</b>	<b>Achievements</b>
<b>1</b>	1 mini depo is prepared for waste separation at community. 1 ton/week of plastic waste diverted from river dumping in East Java. 1 ton/week of waste diverted from river dumping in West Java.	Only one mini-depo (the one in Babakan Village, Cirebon District, West Java.) has been established although not yet equipped and therefore not yet operational. No plastic has been diverted from river dumping yet through the mini-depots. Reportedly, difficulties to establish mini-depots are associated to the need to obtain the permit from the local authorities to use the land for waste management disposal. For instance, the building of the mini depo in Mojekerto was recently cancelled and replaced by another infrastructure in Malang. This is in conflict with what has been reported in PIR 2018. On the number of mini-depo to be developed there are conflicting views within the project document itself and the PMU: 8 mini-depots (page 22 of the prodoc), 3+3 mini-depots
<b>2</b>	2 mini-depots are prepared and technical guideline is established. 4 tons/week of plastic waste diverted from river dumping in East Java. 4 tons/week of plastic waste diverted from river dumping in West Java.	
<b>3</b>	3 mini-depots are established in selected areas.	



6 tons/week of plastic waste diverted from river dumping in East Java.

6 tons/week of plastic waste diverted from river dumping in West Java.

(logical framework), only 3 mini-depots (view of the PMU). The project document is unclear as to 8, 6 or 3 mini-depots have to be established. **There is a substantial risk that even the minimal target of 3 functional mini-depots with 8 tons of plastic / week diverted would not be achieved within the project deadline.**



#### 4.2.2. *Remaining barriers to achieving the project objective*

**Socio-economic barriers.** The project is currently at a crucial turning point. Most of the training and raising awareness activities have been completed, however the impact which may be observed on the field as a result of these activities is limited. Looking at the training materials and training reports, it seems that the activities have been carried out professionally, and the deliverables are of good quality. The question on why the impact of this activity is limited has then to be probably searched on the financial aspects of the recycling economy: the recycling activities are mostly carried out informally by small groups carrying out manually most of the work, and surviving on small marginal prices. The biggest recycling factory visited in Mojokerto has a staff of around 25 persons. The adoption of equal wages, measures for higher safety at work, best processing of plastic and environmentally sound disposal of unrecyclable plastic, would impact the operational cost in such a way that they can be sustained only through a substantial scale-up of the operations, or a substantial public subsidy. In the absence of that, very likely the recycling of plastic will remain a market were only informal operators who externalise all the social and environmental cost of the recycling can survive.

**Technical barriers.** On the side of technical barrier, identifying PBDE contaminated plastic without affecting too heavily the speed and cost of recycling operation is challenging and could be addressed only by the synergy of a specific legislation and a combination of procedures. Indications for possible procedures have been proposed in the technical guidelines developed under the project, which should be tested and implemented. As there are no way to distinguish between different brominated flame retardants with portable analysers (like XRF), at legal level recyclable vs. non-recyclable plastic should be rather based on the total concentration of bromine. Even so, however, it would not be possible to analyse all the plastic during recycling operation with XRF or similar equipment (first of all because these equipment are expensive and out of the reach of small recyclers, and secondly because that would significantly slow down the recycling operations), hence a combination of approaches should be pursued to achieve the result of segregation, at an acceptable cost, of a stream of non-recyclable plastic potentially contaminated by BRF. These should include collection at source, segregation by type of waste, density tests (floating) and only as a confirmation, XRF testing.

**Financial barriers.** No activity has been carried out so far on the identification of a technology for the disposal of the identified brominated plastic. As the choice is limited to incineration and co-incineration, that aspect should not represent a significant technical barrier. However, technical and financial

discussion with cement kiln factories to understand their willingness and technical constraints, as well as costs, should be undertaken. Disposal cost or availability of a disposal technology could be a barrier in case the co-incineration in cement kilns prove to be not viable.

### 4.3. PROJECT IMPLEMENTATION AND ADAPTIVE MANAGEMENT

#### 4.3.1. *Management Arrangements*

The project management arrangement established at inception were substantially in line with the ones outlined in the project document. In summary, the project was managed through:

- A National Project Director in charge of overall direction of the project
- A National Project Manager (NPM) with the task to provide quarterly report, Mid Term report and annual report to UNDP and Ministry of Industry.
- A professional Project Management Unit (PMU), which consists of technical experts and administrative personnel

The Project Manager and Project Management Unit are accountable to the NPD for sound administrative and financial management of the project as well as effective delivery of project activities.

Accountabilities of project management are formally presented to the NPD by timely completion of annual and quarterly work plans and reports with required supporting documents.

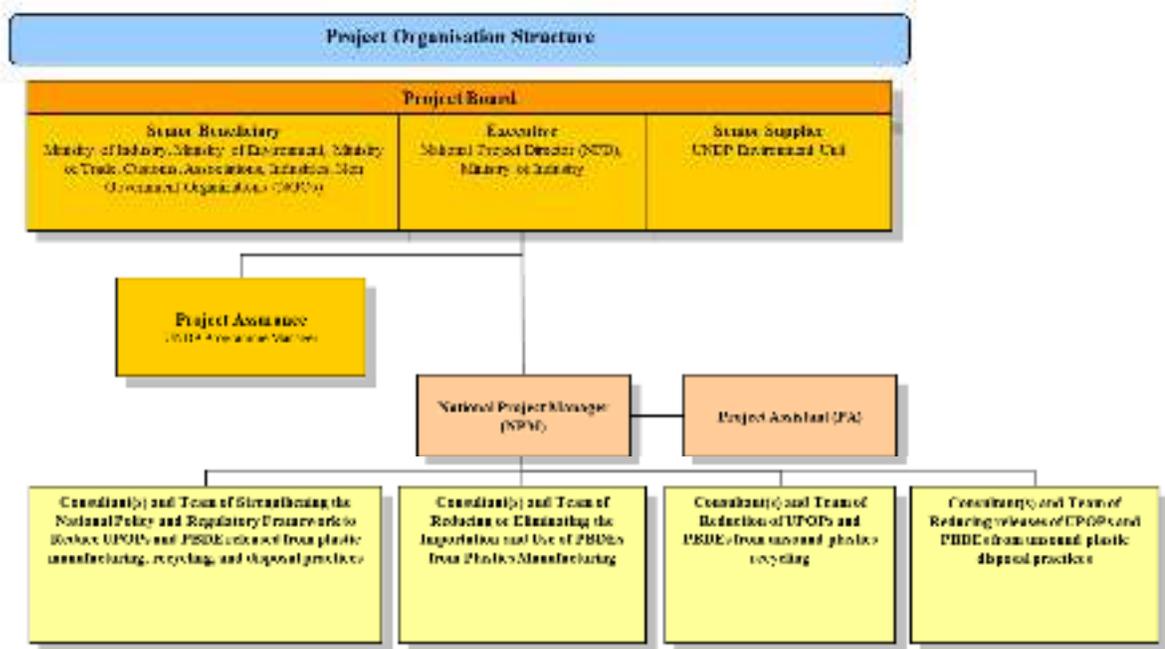
The project has been implemented through National Implementing Modality Country Office Service Support (NIMCOSS) as implementing partner is Ministry of Industry.

The PMU will be located near the office of the Ministry of Industry.

UNDP has regular audit process that will be organized by UNDP Head Quarter. GEF has the regular audit too. Therefore, project should prepare progress report and financial report.

The structure of the Project Management, as reported by the Project Director in his speech held during the Mid Term Review mission (March 13, 2019), is reported in Figure 2

Figure 2: Project Management arrangement



On the side of quality of execution of the Executing Agency (Ministry of Industry, Research and Development department), the following has been noticed:

- 1) The project is considered a national priority and the Executing Agency is highly committed to its success;
- 2) In the beginning of the project, there were some hurdles. Project was placed in another DG in the ministry of Industry, and then moved to the Research and Development DG.
- 3) The Executing Agency has an excellent understanding of social and economic processes underpinning the implementation of the project on the side of the recycling and manufacturing industry,
- 4) The national consultants implementing the project (and more specifically AMC consulting and TUV Nord) delivered high quality deliverables and provided important indications to the project management;
- 5) On the coordination side, the implementing agency has a very good linkage with the other members of the project board (MOEF, BAPPENAS) and associations of industries and recyclers, both formal and informal. However, it has – somehow understandably - less focus on the waste management side, and in this regard a more proactive coordination with the Ministry of Environment and Forest should be pursued. The waste management component (identification and disposal of PBDE contaminated plastic) of the project is the one where all the project GEB should materialize and at the same time is the one with the highest risk of not being achieved.
- 6) On the technical side, the implementing agency has a good knowledge of the aspect and difficulties related to the identification of PBDE, as demonstrated by their report introduced

during the meeting on March 13, 2019. It has the tools (XRF and laboratories) and resources (personnel and project funding) to carry out a massive identification of plastic containing PBDE. However, as of now the identification of PBDE just stopped with the analysis of some 500 samples through XRF, out of which a limited number proved contaminated. Considering the impact these results could have on the industry, and the very low cost of XRF monitoring, the executing agency should push toward a more systematic and scientifically designed monitoring of plastic materials and waste. Moreover, it seems that the executing agency has not elaborated yet a good strategy to achieve the project goal of 1000 tons of plastic contaminated by PBDE to be disposed during project implementation, as the NPD explained during the meeting that *“the PBDE in plastic will be identified at mini depots”*. However, linking the identification of PBDE plastic to the completion of mini-depo would imply the failure of the achievement of the POP disposal target, as the mini-depo would be fully operational only by the end of 2019, which is too close to project end.

- 7) The UNDP country office proved very efficient in facilitating project operations and communication. Remarkable, in this sense, is the identification of the project champion Ms. Ibu Nurul Latifah who was able to bring the issue of PBDE contaminated plastic at the highest level of the government<sup>8</sup>. Ms. Nurul is an example not only in the field of green entrepreneurship; her story represents an example for all the women who are fighting for equal opportunities at work and the right of education.
- 8) Based on the outcome of the meetings, the UNDP country office is perceived as a reliable and efficient partner in project implementation by all the stakeholders interviewed.
- 9) On the administrative standpoint, UNDP CO is capable to provide information on the budget in timely manner. Interviews with members of the project board confirmed that they received periodic information on the status of the project budget in a timely and transparent manner.

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#### 4.3.2. Work planning

Based on the GEF records, the project approval was signed by the GEF secretariat on Dec 11, 2014. The project document set 1 January 2016 as starting date for the project, and 30 December 2019 as end date.

The project inception workshop only took place on 29 March 2016. The inception report established as project official start date March 2016, and March 2020 as end date.

There were no changes proposed at inception on the result framework, and indeed the project inception report only include minutes of the speeches and a statement on project implementation.

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<sup>8</sup> <http://www.id.undp.org/content/indonesia/en/home/presscenter/articles/2019/international-womens-day--a-domestic-violence-survivor-turns-int.html>; <https://twitter.com/undpindonesia/status/1103891864887808001?s=12>

The project work-planning started with the preparation of the project document itself, which contains budgeted work plans for the year 2016 to 2019. A rapid checking of the consistency of the workplan signed in 2017 with the workplan prepared during project document preparation revealed that the two workplans are consistent from both the financial and technical standpoint, and which are result-based (budget linked to the achievement of outcomes).

The project result framework is clearly used as a reference in the preparation of the QMR and of the PIR, and it represented therefore a key management tool for the project implementation

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#### 4.3.3. *Finance and co-finance*

Table 8 and Table 9 the data concerning budget expenditures by year and by budget activities are reported. Out of an allocated GEF grant of USD 3,990,000, there are still 1,402,441 USD available for the last year of project implementation and project closure, out of which 628,653 USD represents commitments subscribed in 2018. The remaining budget for 2019 and 2020 implementation is therefore 773,788 USD. The analysis of project expenditures by component is more uncertain, as figures for the year 2017 are not disaggregated by activity, and therefore the disaggregated figures for that period have been estimated based on the average of the other years. However, from the available data the following consideration can be made:

- There is no remaining budget for component 4 (Disposal practices). This budget line is the one associated with the development of the mini-depots. 823,347 USD have already been committed for the procurement of the equipment for the first mini-depot in Cirebon and the second mini depot in Mojokerto. However, the project management recently informed the reviewer that the mini depot in Mojokert had to be cancelled due to delay in providing the legal documents, and replaced by another infrastructure in Malang. The building of a third mini-depot would likely require re-allocation of funds from other activities, as it is understanding of the evaluators that procurement activities for the third mini-depot did not started yet.
- There is still significant budget available under component 3 (Plastic recycling). This component includes the budget for the disposal of up to 1,000 tons of PBDE contaminated plastic. However, there is a large
- financial uncertainty for this component, as no negotiations has been started with potential providers of disposal services (i.e. cement kilns), and as of now, no PBDE contaminated plastic have been segregated. Indeed, there is uncertainty even at the level of the presence of PBDE contaminated plastic, as the information gathered through sampling and analysis of plastic items are too limited. In the absence of this information (extent of plastic contamination, and market price for incineration of plastic) it's not possible to provide indication on the allocation of the remaining funds. Besides, it should be considered that the destruction of POPs is one of the key project objectives, and is the only one which is relevant from the standpoint of Global Environmental Benefit.

Table 8: Project budget (GEF Grants) by implementation year

	2016	2017	2018	2019	2020	2019	
Resource Allocation	3,990,000.00	3,428,124.89	2,545,764.63	1,402,441.48	50,563.00	Comm2018	628,653.11
Budget Allocation	861,000.00	1,441,500.00	1,106,000.00	1,352,441.48	50,563.00	2020	50,563.00
Expenditures +Commitments	561,875.11	882,360.26	1,143,323.15	628,653.11		Balance	773,788.37
% (yearly)	65%	61%	103%	46%			
% (project allocation)	14%	36%	65%	81%			

Table 9: Project budget (GEF Grants) by implementation year and activity

Year	2016	2017	2017	2017	2018	Commitment 2018	GEF Budget	Balance
		(Jan-Jun)	(Jul-Sep)	(Oct-Dec)				
Activity 1 - National policy	66,638	76,452	48,032	62,158	219,426	85,625.9	627,000	68,668.1
Activity 2 - Plastic manufacturing	124,343	53,868	61,772	125,007	157,167	190,185.84	668,000	-44,342.84
Activity 3 - Plastic Recycling	103,639	119,195	59,914	71,766	229,219	186,366.08	1,505,000	734,900.92
Activity 4 - Disposal Practices	242,117	71,319	21,053	46,208	442,550	141,459.92	900,000	-64,706.92
Activity 5 - M&E		8,203	913	15,807	22,430	10,027.51	100,000	42,619.49
Activity 6 – PM	25,138	11,684	11,947	16,963	72,531	14,987.86	230,000	76,749.14
	561,875	340,721	203,611	338,009	1,143,323	628,653.11	1,143,323	813,887.89

Evidences of the willingness of co-financing were found during meeting with the stakeholders, in particular the meeting at Bappenas (meeting of 14/03/2019) revealed that the government is willing to support the development of mini-depots with additional resources, whilst the meeting with Head of Industry and Trade Office (Kadispendag of Mojokerto) revealed that “The district government has prepared 1ha land for the development of the mini depot, on top of that, the provincial government is ready to hand over 2 ha of land to support the mini depot facilities (to be developed as storage areas, expanded processing areas, etc)<sup>9</sup>.

In term of co-financing, the project management shared the following information:

Total Co-financing: USD 18,691,594

1. Mol: USD 5,000,000, as follows:

- Finalize the draft of act of Chemical Substances initiated by Directorate of upstream chemical industry
- Provide New GC-MS for Center for Packaging and Chemical, Mol
- Develop Green Industry Standard
- Technical Meeting

2. APHINDO: USD 12,000,000, as follows

<sup>9</sup> The reviewers were informed on May 29, 2019, that the plan to build a mini depot in Mojokerto was halted due to difficulty in getting the needed legal document, and replaced by another infrastructure in Malang.

- Develop waste water treatment plant
- Develop Industrial standard
- Dissemination on government regulation
- Promote greening products
- Promote on resource efficiency and circular economy
- Technical meeting

3. Perum Jasa Tirta: USD 1,525,188

4. Konsorsium Lingkungan Hidup: USD 166,406

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#### 4.3.4. *Project-level monitoring and evaluation systems*

The project management shared all the quarterly monitoring reports (QMR) together with the Internal Project Assurance Reports for the years 2016 and 2017, and the first 2 QMR reports for the year 2018. The evaluator also received the project inception report, and the PIR (Project Implementation Review) for the years 2017 and 2018.

The project management also shared the POPs tracking tool drafted in the course of PIF preparation (2014) and in 2019.

Starting from the POPs tracking tool, it is noted that the first one prepared during the PIF reported an expected amount of 10gTEq of PCDD/F reduction as a result of project implementation, whilst no reduction estimated were provided for the new POPs.

The POPs tracking tool prepared in 2019 instead reported an amount of POPs chemicals (PBDE) phased out as following: target reduction 800 tons; achieved to date, 870 tons, justified as “calculated based on E-waste import to Indonesia”. Concerning this achievement, there is no evidence in any of the QMR or PIR reports, which instead identify the issue of no disposal of PBDE plastic waste as the only target not achieved by the project. Therefore, the evaluators assume that the figure reported in the POP TT is wrong and has to be amended. The POP TT also identifies the development of the mini-depot infrastructure as “been placed in Cirebon, West Java in order to exempt POPs especially PBDEs”, however the GoV of Indonesia did not apply for any exemption for PBDE, therefore it is assumed that even this entry in the POP TT is wrong. The project POP-TT has therefore to be amended.

Through the reading of the QMR and the PIR the following is noticed:

- QMR and PIR are valuable sources of information on the activities carried out by the project.
- No budgetary information is reported either in the QMR or in the PIRs.
- QMR and PIR do not provide indications on the actual impact of project activities, or to identify corrective actions or strategies to address issues in case the targets are not achieved. For instance, it is evident that the increased capacity of recyclers and manufacturers to identify PBDE contaminated plastic cannot be measured only in terms of number of participants to workshops and seminars (page 6 of the PIR), but should also be based on the number of tests carried out and the amount of PBDE plastic identified; and as far as gender mainstreaming issues are concerned, the QMR and the PIR make reference to the indicators to assess project progress, without considering whether these indicators are sufficiently measurable and specific.
- QMR and PIR do not report difficulties which were instead described by project experts, with specific reference to the difficulties in implementing the guidelines, as reported for instance in the already mentioned AMC report on the development and implementation of guidelines for recyclers. In this sense it seems that a proper communication between the expert in charge of

implementing such activities and the project management was missing, and important message to improve the project impact were not conveyed to the PUR.

The difficulties, for these evaluation tools, to go beyond the mere listing of activities carried out is evident in the case of the two tasks on which the project is facing mode delay – the development of the mini-depots and the disposal of PBDE plastic. In one case, the PIR 2018 is simply stating that “The activity is currently on track”, whilst through the discussion with the project management it emerged that the activity suffered significant delays due to permitting and siting issues. In the second case – the disposal of PBDE-contaminated plastic – the difficulties are more profound and not only related to project management issues. Difficulties on PBDE-plastic disposal starts from the technical complexity of identifying such plastic, and are enhanced by the financial impact such identification could have on plastic recycling operation and the limited investment and technical capacity of the informal recyclers who operate on very small profit margins.

In summary, it is opinion of the evaluator that, in case of innovative projects like this, the ordinary monitoring tools are not enough to capture the real challenges and difficulties of the project; more attention should be paid not only to the formal completion of the activities but also to the impact achieved, the quality of the reports, the technical constraints as reported by the project experts. More communication between experts and managers on project challenges is probably needed.

In term of financial management of project monitoring no particular issues have been identified. The M&E budget (230,000 USD including 40,000 USD from UNDP co-financing) appear sufficient to carry out M&E activities and as of early 2019 it seems that enough resource would remain available to carry out the final evaluation of the project.

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#### 4.3.5. *Stakeholder engagement*

The engagement of stakeholders is probably one of the strongest points of the project. The evaluators were able to meet the following stakeholders and through direct questions and questions aimed at cross-verifying the information received, were able to confirm that the project established sound cooperation with:

- 1) Association of plastic industries: Aphindo
- 2) Association of plastic recyclers: Apdupi (small scale) and Adupi (formal, large scale)
- 3) Plastic industries: Intera
- 4) Recyclers and waste scavengers;
- 5) Local Communities
- 6) Community and Islamic Boarding School in Babakan Village Cirebon, Tawang Sari and Kejagan Villages Mojokerto, Depok
- 7) Ministry of Environment, Ministry of Finance, National Planning Agency.

The NPD in his presentation also listed the following NGOs as involved in the project implementation:

Loh Jinawi, Wahana Edukasi Harapan Alam Semesta (Wehasta), Bank Sampah Mandiri, Paragita, My Darling (Sadar Lingkungan), Waste4Change, Bank Sampah Nusantara Latanza.

It is also evident that the national and local governmental stakeholders are strongly supportive of the objectives of the project. This was confirmed during the following meetings:

Meeting with BAPPENAS, where, among others, the deputy-director of the Creative Economy Department said that *“We want the project to be internalized in our system. We expect regulation to be enacted soon. We want to solve the issue of import.”*

Meeting with the Head of Industry and Trade Office /KADISPENDAG of MOJOKERTO: *“The district and provincial government have high hopes for the mini depot in Kajangan, Trowulan. The district government has prepared 1ha land for the development of the mini depot, on top of that, the provincial government is ready to hand over 2 ha of land to support the mini depot facilities (to be developed as storage areas, expanded processing areas, etc)”*.

Meeting with the directorate of Loan and Grant Administration: good communication with the project, they went on site to see producers and recyclers of plastic and the mini depot. They suggest putting more effort on the regulation aspects.

Meeting with MOEF: MOEF Strongly support the project, and considers there should be a ministerial regulation to regulate and manage POP waste. Government needs to give room to informal waste operator and legalize them. 7000 waste banks are currently under the guidance of MOEF.

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#### 4.3.6. Reporting

From the analysis of the reports (inception report, PMRs, PIRs) it is evident that the project did not undergo any significant change. The only change observed by the evaluators concerned the activity related to the import control and restriction of plastic PBDE. As the import of plastic is currently banned in Indonesia, this has been replaced by self-control and self-certification of the content of PBDE in plastic.

Indeed one of the observed shortcomings was that the reporting failed to identify difficulties or delay in project activities – the most important being the delay in the establishment of mini-depots and the difficulties in the implementation of the guidelines on PBDE plastic segregation, with the consequent delay in the segregation and disposal of PBDE contaminated plastic.

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#### 4.3.7. Communications

As already explained in section 4.2.1 (Progress towards outcomes analysis) under the project a significant number of training and awareness raising events were carried out. Training was developed through classroom lessons, tryout lessons, focus group discussion (FGD), videos, addressed to both manufacturers of plastic components and recyclers. Training involved 10 plastic manufacturers and 6 recyclers, and awareness raising was carried out in 16 locations, and attended by 1380 females and 1539 males. Very likely, stakeholder involvement and public awareness contributed to the progress towards achievement of project objectives; plastic recyclers have high expectations that through

building of mini-depots, the pollution generated through improper plastic disposal (currently through burning in brick furnaces) will cease, and higher prices may be negotiated because of the increased quality of plastic. In general, the message conveyed with training and awareness raising that a better segregation of plastic is beneficial from both the environmental and financial standpoint catalyzed the attention of all the plastic recycling operators (formal and informal recyclers, manufacture industry) which have great expectations in the project. However, most of the operator are reluctant to adopt PPE or segregation technology at this stage, and are postponing this actions to the delivery and operation of the mini-depots.

#### 4.4. SUSTAINABILITY

##### 4.4.1. *Financial risks to sustainability*

**Moderately Likely. (ML)** Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Mid Term Review.

During the implementation period, the project has started to introduce and provide training on financial planning and management by impacting knowledge to both women and men's workers at plastic recycling sectors. Meetings to budget planning to sustain the work plan has been held since 2016, which involved the institution related to finance. Such budgeting is prepared annually through the Annual Work Plan (AWP) of the project.

The project intends to ensure sustainability during the implementation period through the financial incentives, provided for the corporate social responsibility programs, such as supporting the ISO certification of manufacturers to prevent the use of PBDE contaminated plastic, equipment investments for environmentally sound operations and management.

Still, financial resource in dealing with the chemical management in both of the government and industry are still lacking and therefore need to be assisted.

Also, the implementation, enforcement and monitoring of the related policies and programs of the project depend mostly on districts and municipalities that often lack technical expertise as well as the financial resources which poses a risk to the sustainability to the overall project.

Waste management in this sense still possess risk in the sense that most of informal plastic recycling sector would rely on financial incentives to adopt environmentally safe procedures and ensure health and safety at work. Although the project put a high emphasis on economic incentives for informal sector to separate PBDE containing waste, these incentives would materialize mostly with the delivery of the mini-depots and associated equipment. Likely, once these infrastructures are operational, this will translate into higher revenues from plastic recycling business, which can be at least partially reinvested to sustain ESM management and HSE at work. The financial impact of these infrastructure should be monitored for a period long enough after installation.

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#### 4.4.2. *Socio-economic risks to sustainability*

**Moderately Likely (ML)** Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Mid Term Review.

Risk poses by the socio-economic aspect to the sustainability is crucial for the project. The main risk is stemming from the lack of awareness or information of the community member regarding the danger of POPs, especially the knowledge on the link of socio-economic benefits associated with sound chemical and waste management. To mitigate this risk, the project has designed capacity building programs that not only cover technical PBDEs handling and management on plastic product and waste, but also covering social-economic dimensions such as education on health protection and financial literacy too the most vulnerable group that may be impacted from such dangerous exposures.

At the institutional level, the ownership of the project is high. Meetings with different institutional stakeholders, (Ministry of Environment and Forests, Ministry of Industry, associations of industry and recyclers, Bappenas) all revealed commitment toward project objectives, in some cases with proposal and ideas going beyond the project objectives and deadlines (for instance, the proposal of Direktur Industri, Tourism and Creative Economy to find ways to further support the development of mini-depots).

The project delivered a significant number of training and awareness raising initiative on both the side of plastic manufacturers and plastic recycling operators. In 2017, such events are held in Mojokerto (East Java) and Bandung (west java). In total, 7 workshops were held to disseminate the impact of PBDE and waste management for the plastic-based manufacturers with 730 attendees in total. The meetings of the Mid Term Review team with associations and representatives of manufacturers and recyclers also revealed their awareness and commitment toward the project objectives, and also clarified what would be the main constraints for a sustainable implementation of actions aimed at improving working conditions and preventing the release of PBDE and U-POPs.

The project therefore already contributed the level of awareness of the key actors, which is the first and fundamental brick to ensure that the sought changes will happen. The question is however whether the current socio-economic structure of the operators (recyclers and manufacturers) are efficient enough to support the change. On this aspect, learning how the project ensured the certification of PBDE-free plastic in the manufacturing sector was an interesting lesson. ~~Nine~~ ten small manufacturing enterprises were supported to get a ISO-9001 certification which include traceability and PBDE-free certification of the raw material. These SMEs are willing to support the cost of renewing the certification after project ends, as it ensures them a larger access to the market. However, at the same time this means that these industries won't be allowed to procure plastic recycled from small, informal recyclers which at this stage cannot support a sound segregation of PBDE contaminated plastic. Therefore, the evaluators consider that, whilst awareness is a key component toward socio-economic sustainability, in the short-medium term informal operation of recycling would not ensure the same. A shift toward a more formal

and organized structure in the recycling sector, with potential to scale up operation and to invest in the environmental and social aspects will be soon needed.

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#### 4.4.3. *Institutional framework and governance risk*

**(Rating: Likely/L to be sustainable.** There are negligible risks affecting this dimension of sustainability, with key outcomes expected to continue into the foreseeable future)

In enhancing the sustainability from the perspective of the institutional framework and governance risk, the project initiated to build up the focal point for knowledge management and institutional knowledge on PBDEs and gender in the context of hazardous chemical risk exposures. An arranged group of potential trainers, both men and women, is tasked to facilitate trainings on gender-sensitive health and safety protection and financial literacy. Further, to further mitigate the risk, Ministry of industries has developed module trainings reporting period (BAT/BEP module) for industries and plastic recycling sector, gender and gender sensitive health and safety protection module training, financial literacy module training. It is aimed to serve as tools for sustainable capacity building in the proper handling of PBDEs containing plastics.

Additionally, the sustainability of this project can be seen from the strong support from relevant ministries/agencies. Ministry of Environment and Forestry, Ministry of Health, Ministry of Trade, BPPOM and Bappenas has also been involved in this project to support it in line with the Indonesia's commitment to reduce PBDE as hazardous chemicals and UPOP's emissions by ratifying the Stockholm Convention on POPs through the Law No. 19 of 2009.

In 2016, the project has selected nine competent institutions to carry out the selected component of the project. Coordination meetings are also hold between these institutions and relevant stake-holders to exchange information on the project components being executed. By the last quarter of 2016, cooperation with 2 universities and institution are also established to enhance the sustainability of the project.

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#### 4.4.4. *Environmental risks to sustainability*

**Moderately Likely (ML)** Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Mid Term Review

The project is intrinsically sustainable from the point of view of the environment, as its main purpose is to reduce the environmental impact of plastic lifecycle (through environmentally safe production, recycling and waste management). Therefore, there are no threats on the environmental sustainability from the project; the only threat is whether the project objectives could be achieved or not.

It has already discussed about the effectiveness of actions aimed at enhancing capacity building and awareness. Not only the stake-holders, public awareness on the danger and impacts of PBDEs towards human health was developed through various Focus Group Discussion (FGDs) and

dissemination workshops. These activities were targeted at plastic-based manufacturers, such as automotive, electronics and plastic raw material sectors manufacturer with the expected result that the involved parties will have the capacity to identify PBDE in their raw materials for production process and consider alternative substances. To mitigate the risk of environmental risk, the targeted participants are enriched with the information on the definition of PBDE, samples of PBDE containing products, the danger and impacts of PBDE's toward human health and environment and PBDE emission in production process.

On the matter of environmental risk to sustainability of the project, in relation to the PBDEs and UPOPs release to the environment, several indicators shall be taken into consideration. One is the number of mini-depots for waste separation established at communities shall be one of the indicators in sustainability of the project. Currently, the project is at risk at achieving the reduced target of 3 mini-depots to be operational by project end. Another indicator is the amount of PBDE-contaminated plastic segregated and disposed. Currently, no PBDE-contaminated has been segregated and disposed, against a cumulative target of 800 tons for the 3<sup>rd</sup> year, and the discussion on potential technologies for disposal of such waste did not start yet.

During the project period, three mini-depots are estimated to be built and until 2018, one mini depo is developed and awaiting to commence its activities in Cirebon. The establishment of these mini-depots is to sustain the project through the separation of PBDE wastes at community and develop an appropriate municipal waste separation scheme and solution for final disposal of PBDE wastes.

TO be fully sustainable from the environmental standpoint, it's likely that the project deadline should be postponed to ensure enough time for achieving and monitoring the sought environmental targets.

## 5. CONCLUSIONS AND RECOMMENDATIONS

### 5.1. CONCLUSIONS

#### 5.1.1. *Comprehensive and balanced statements*

The project "*Reducing Releases of Polybromodiphenyl Ethers (PBDE) and Unintentional Persistent Organic Pollutants (UPOPs) Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia*" is one of the first projects aimed at addressing the issue of the disposal of PBDE contaminated plastic which was approved by the GEF: The project intends to prevent the use of PBDE in the manufacturing industry, and to ensure that PBDE contaminated plastic is segregated by the plastic recyclers and disposed of in an environmentally sound way.

The project relies on a systematic training and awareness raising campaign to promote the behavioral change of the operators, and on the delivery of small treatment centers (which would otherwise be out of the financial capacity of the recyclers) to carry out the segregation and disposal of contaminated plastic in an efficient, environmentally safe and financially sustainable way.

The project is perceived as high priority both at the institutional level and at the level of private operators.

Currently the project achieved good results in term of training and awareness raising, and was able to deliver the first infrastructure (mini-depot) for the storage and processing of plastic waste in Cirebon.

A draft on regulation on controlling the use of PBDE and other dangerous chemicals listed under the Stockholm Convention has been prepared but is currently halted due to the different views on the matter of the MOI and MOEF.

The project is late on the delivery of the other 2 mini-depots, out of which one has been approved and underwent the procurement process, whils the 3rd one is still in the design stage.

The project is facing technical and social difficulties ensuring the implementation of the guidelines for the segregation of PBDE plastic in the plastic recycling sector, with the result that after 3 years of implementation, the segregation and disposal of plastic contaminated by PBDE did not started yet, against a target for the 3rd year was of at least 800 tons of PBDE contaminated plastic disposed of.

In term of project design, the project logframe is still considered valid with the following exceptions:

- 1) The enactment of the regulation on PBDE is out of the control of the project and therefore the indicator should only concern whether a draft regulation has been drafted and accepted by the project board (MOI, MOEF, UNDP and associations of industry and recyclers);
- 2) Indicators on capacity building should be more concrete and include not only the number of operators trained, but also the amount of plastic product and waste checked for their content of PBDE;
- 3) Indicators on gender mainstreaming should be more concrete and include for instance the number of women participating in training and awareness raising, as well as equal job opportunity and equal treatment at the workplace.
- 4) Indicators and target related to the segregation and disposal of PBDE contaminated plastic and the number of mini-depot to be established should be reassessed.

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#### 5.1.2. Recommendations

The project is only 10 months far from the deadline which has been set as March 2020. In this period of time, the following remaining targets should be achieved:

- 1) The legislation on the control of PBDE and other POPs has to be approved by the project board and endorsed; (Outcome 1)
- 2) At least 3 mini-depots (target in the project logframe is 6) should be completed and operational, with an amount of 8t/week of plastic diverted from dumping in rivers (Outcome 4)
- 3) At least 1000 tons of PBDE containing plastics are separated and safely disposed. (Outcome 3)
- 4) The technical guideline is integrated into 3 plastic recycling practices (Outcome 2)

Out of the above 4 targets, the reviewers consider that only the one related to the technical guideline has chances to be achieved within the project timeframe, whilst the others would be only partially achieved.

Concerning the disposal of 1000 tons PBDE contaminated plastic, is unclear whether the target is realistic as the project has generated so far too limited information related to the expected amount of PBDE contaminated plastic. As there is currently no regulatory limit in Indonesia concerning the level of PBDE to be considered acceptable in waste, a target level of 0.1% or lower should be considered.

The following recommendations should be therefore considered by the Project Board and UNDP CO to ensure that the project will achieve its goals:

- 1) Concerning the formal enactment of the regulation on PBDE and other POPs: for legal reason, this achievement is beyond the reach of project implementation. It is recommended therefore to set as target for this component only the drafting of the regulation on PBDE and POPs, provided that the draft is approved by the key stakeholders of the project board (MOI, MOEF, UNDP and representatives of manufacturers and recyclers) for submission to the legislative process.
- 2) Concerning the establishment of mini-depots:
  - a. UNDP CO should provide a rationale on how the target, initially set at 6 mini-depot in the project log-frame, has been reduced to 3, so that the target can be officialised – for instance, will the 3 mini-depots currently envisaged capable of the same throughput (8t plastic/week) planned for 6 mini-depots established by the project logframe?
  - b. UNDP CO and the project board should also assess whether the remaining budget for component 4 is enough for the procurement of the remaining 2 mini-depots.
- 3) Concerning the disposal of PBDE contaminated plastic:
  - a. It is noticed that a significant amount of “*heavy, non-recyclable plastic*” is currently accumulated at the recycler facilities and then improperly disposed (likely with generation of a significant amount of U-POPs) through burning in brick furnaces. With available resources, the project should carry out a wide sampling and analysis exercise at the recycler premises to quantify the level of PBDE contamination of the non-recyclable plastic in comparison with the recyclable plastic. It is suggested to carry out a number of measurements with XRF in the order of around 5000 and carry out at least 1% of confirmatory analysis with GC/MS. A sampling and analytical plan should be drafted, discussed with academic experts, and then implemented.
  - b. The segregation, storage and disposal of non-recyclable plastic is already occurring independently from the establishment of mini-depots infrastructures, though in a way which is not environmentally sound. Considering that in any case the disposal of this plastic is currently generating U-POPs, the project, before the completion of mini-depots, should establish as soon as possible a partnership with the cement industry to

dispose this plastic through high-temperature incineration. The partnership should include also at least one Proof of Performance test to ensure that the disposal through cement kiln is compliant with the Stockholm Convention BAT/BEP on co-incineration.

- 4) Concerning the adoption of PPE at workplace: the project should undertake a number of inspections at the premises of the recyclers and manufacturers factories to understand the actual implementation of the health protection measures at workplace, and try to identify the cause which are currently hindering the adoption of these measures.
- 5) Concerning the gender mainstreaming aspects: MOI should quantify the gender-disaggregated number of participants to training, and should conduct a survey on the situation of disparity of economic treatment between male and female among the operators who attended the training or the awareness raising event. The survey should try to identify the cause which are currently hindering the reduction of disparities among genders in the plastic recycling and manufacturing sector.
- 6) The implementation of the above recommendations is likely not achievable within the expected deadline (March 2020). UNDP CO and the project board should develop a timeframe with milestones providing realistic deadline for all the project output to be completed, so that a request of project extension to UNDP HQ and the GEF can properly substantiated.

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#### *5.1.3. Corrective actions for the design, implementation, monitoring and evaluation of the project*

The recommendations above already contain the indication of the corrective actions related to project design and implementation. Limited amendments of project design are limited to revision of few indicators and targets:

- To ensure measurability of the achievement of Gender Mainstreaming goals,
- To reflect the legal framework relevant to the law-making process;
- To reflect the actual situation in the development of mini-depot, provided that in this case the revision of the targets does not imply a reduction of the amount of plastic which will be processed
- To review the target of PBDE contaminated plastic or the target concentration above which the plastic has to be considered PBDE contaminated and then disposed.

On the monitoring and evaluation side, proper communication should be ensured among project board, the expert team and UNDP CO, to ensure that the monitoring report can really provide timely insights and solutions on the technical, financial and social issues discovered in the course of project implementation. This could be for instance achieved by involving technical experts in the drafting of relevant parts of the PIR and PMR.

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#### *5.1.4. Actions to follow up or reinforce initial benefits from the project*

The project achieved outstanding results in the field of communication of environmental issues associated with plastic recycling (through wide training and awareness raising efforts, and the examples

brought by project champions). Initially, this communication strategy generated an enthusiastic support toward the implementation of health protection measures and interest toward a better segregation of plastic. Later, as informal recyclers cannot sustain the financial effort needed to improve their process and ensure the environmentally sound management of plastic waste, the strategy of the project has been to create mini-depots as infrastructures available to informal recyclers. The delay observed in the development of these infrastructures, and the fact that these are expected to cover only a small fraction of the amount of plastic processed (10% in case of the Mojokerto area) has probably caused a loss of momentum. This may be further aggravated by the fact that the Mojokerto mini depots has been cancelled, due to delay in providing the necessary legal document. There is therefore the need, from one side, to understand what the obstacles toward a more sustainable implementation of measure aimed at protecting the health and the environment in the sector of plastic recycling are, and from another side to carry out additional surveys to measure the effectiveness of implementation of the guidelines prepared under the project. Moreover, considering that the mini-depots will be operational toward the end of the project, and that they will in any case cover only a small fraction of the plastic waste processed in the respective areas, there is the need to identify measures which can be of support for the implementation of health and safety measures independently from the operations of the mini depots.

#### *5.1.5. Proposals for future directions underlining main objectives*

One of the main uncertainties related to project dealing with PBDE in plastic waste relates to the understanding of the extent of the problem and how the contamination of recycled plastic results in the contamination of plastic products.

On the identification side, currently there are no screening tests capable to distinguish between different brominated flame retardants in plastic, therefore POPs vs. non-POPs brominated flame retardants can be only identified through laboratory analysis to be carried out with GC/MS.

On top of that, the amount of data to relate the concentration of POP PBDEs to other indirect parameters like the type and use of the product, its age, type of plastic are still scarce.

The difficulty in identification obviously is reflected in difficulties in segregation. A number of approaches have been proposed (see for instance UNEP<sup>10</sup>, ACEA/Öko Institute<sup>11</sup>), however the reality is that an

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<sup>10</sup> UNEP, Revised draft guidance on best available techniques and best environmental practices for the recycling and waste disposal of articles containing polybrominated diphenyl ethers listed under the Stockholm Convention (UNEP/POPS/COP.7/INF/22)

<sup>11</sup> Öko Institute e.V. Effects on ELV waste management as a consequence of the decisions from the Stockholm Convention on decaBDE, study commissioned and funded by ACEA, the European Automobile Manufacturers Association. Darmstadt, 18.9.2018.

efficient segregation of POP-PBDE (or even BFR) contaminated plastic is out of the reach of small informal recyclers. This means that the procedures for segregation of contaminated plastic involving informal recyclers should be based on simple approaches like: segregation based on the type of article (plastic from vehicles and old EEE being more likely to be brominated), and only after that, density methods when applicable. Laboratory or XRF testing could be provided as an external service as most of the small recycler would not have the financial and technical capability to afford that.

In a social context where plastic scraps are collected and processed by informal small scale recyclers, quality standards on the recycler side should be established based on the probability of BFR presence in plastic rather than on the actual amount on the POP BFRs. This would obviously need research to understand how some indirect indicators (like density, colour, type of article) related to the concentration of POP BFRs.

On the side GEB policy, this means that projects for the sound management of PBDE contaminated plastic cannot be assessed based on the mere arithmetic counting of the amount of PBDE molecules destroyed in compliance with article 6 of the Stockholm Convention because in the best case, only an estimated amount of PBDE destroyed with plastic waste can be generated by these projects. Considering the social context of these projects, the GEB should be rather based on the amount of plastic "with high probability of POP contamination" being prevented to re-enter the manufacturing cycle, where "high probability of POP contamination" should be based on a limited number of indirect though reliable indicators.

## 6. ANNEXES

### 6.1. TERM OF REFERENCE FOR THE MID TERM REVIEW

# UNDP-GEF Midterm Review

## Terms of Reference for International Consultant

**Project title: Reducing Releases of Polybromodiphenyl Ethers (PBDE) and Unintentional Persistent Organic Pollutants (UPOPs) Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia**

**Category of consultant: C – Senior Specialist**

### 1. INTRODUCTION

This is the Terms of Reference (ToR) for the UNDP-GEF Midterm Review (MTR) of the *full*-sized project titled Reducing Releases of Polybromodiphenyl Ethers (PBDE) and Unintentional Persistent Organic Pollutants (UPOPs) Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia (or PBDEs-UPOPs for short) (PIMS# 5073) implemented through the Ministry of Industry (MoI), which is to be undertaken in 2019. The project started on the 16 *March* 2016 and is in its *third* year of implementation. In line with the UNDP-GEF Guidance on MTR, this MTR process was initiated before the submission of the second Project Implementation Report (PIR). This ToR sets out the expectations for this MTR. The MTR process must follow the guidance outlined in the document *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* ([http://web.undp.org/evaluation/documents/guidance/GEF/mid-term/Guidance\\_Midterm%20Review%20\\_EN\\_2014.pdf](http://web.undp.org/evaluation/documents/guidance/GEF/mid-term/Guidance_Midterm%20Review%20_EN_2014.pdf)).

### 2. PROJECT BACKGROUND INFORMATION

Project period:	48 months
Allocated resources from GEF:	US\$3,990,000
Co-financing:	
• UNDP:	US\$40,000
• Ministry of Industry:	US\$5,000,000
• APHINDO:	US\$12,000,000
• Perum Jasa Tirta:	US\$1,525,188
• Konsorsium Lingkungan Hidup:	US\$166,406

Indonesia is committed to addressing the threats posed by Persistent Organic Pollutants (POPs) to human health and the environment. The country ratified the Stockholm Convention in 2009 by publishing Law No. 19/2009. Indonesia purpose urgent actions to reduce the impact of Polybromodiphenyl Ethers (PBDE), a flame retardant, and UPOP emissions that are harmful to the environment and human health, by reducing the use of PBDE in the plastic manufactures, as well as to improve the recycling and disposal technique to be better and safe.

Project of reducing releases of Polybromodiphenyl Ethers (PBDE) and Unintentional Persistent Organic Pollutants (UPOPs) originating from unsound waste management and recycling practices and the manufacturing of plastics in Indonesia is a collaboration project between the Indonesia Ministry of Industry and the United Nations Development Programme (UNDP), funded by the Global Environment Facility (GEF). The project aims to reduce releases of PBDEs and UPOPs by improving overall life-cycle management of plastics and PBDEs-containing plastics through the introduction of alternatives to PBDEs in plastics manufacturing processes and the application of BAT/BEP in plastics recycling and disposal practices.

The project supports Indonesia's plastics industry and recyclers in ensuring that no banned PBDEs are used or recycled into new manufactured articles. In addition, environmentally safe and sound operations of municipal and community waste management will be supported in order to reduce harmful releases of PBDEs and UPOPs. While the core objective of the project is reducing releases of harmful chemicals, it brings additional benefits in terms of socio-economic and climate change, as it has two activity areas that are inherently climate beneficial i.e. increased recycling and material efficiency and better waste management. The project is structured in the following outputs:

Project Outcome: To reduce releases of PBDEs and UPOPs by improving overall life-cycle management of plastics and PBDEs-containing plastics through the introduction of alternatives to PBDEs in plastics manufacturing processes and the application of BAT/BEP in plastics recycling and disposal practices.

Output 1: Strengthening the national policy and regulatory framework to reduce UPOPs and PBDE releases from plastics manufacturing, recycling and disposal practices

Activity Results 1.1: Reduced PBDEs and UPOPs releases resulting from unsound waste management practices through the adoption and implementation of standards/measures, policies, plans and regulations.

Output 2: Reducing or eliminating the importation and use of PBDEs in plastics manufacturing

Activity Result 2.1: Sufficient national technical expertise built to meet challenges with PDBEs in manufacturing and plastic raw material recycling

Activity Result 2.2: PDBE releases to the environment from the manufacturing sector reduced through phase out and introduction of PBDE avoiding quality control of raw material and awareness raising

Output 3: Reducing of UPOPs and PDBEs from unsound plastics recycling

Activity Result 3.1 Reduced releases of PBDEs as a result of improved handling, storage, recycling and disposal of PBDEs containing wastes and products through the introduction of BAT/BAP in the plastic recycling sector.

Activity Result 3.2 Reduced releases of UPOPs as a result of improved raw material (recycled plastics) supply chains as well as the introduction of environmentally sound disposal practices at recycling entities.

Output 4: Reducing releases of UPOPs and PBDEs from unsound plastic disposal practices

Activity Result 4.1: PBDEs and UPOPs releases to the environment reduced through the implementation of appropriate disposal options for hazardous and unrecyclable plastic waste fractions from both formal and informal recyclers and waste collectors.

Output 5: Monitoring, learning, adaptive feedback, outreach, and evaluation

Activity Result 5.1: Monitoring and Evaluation and adaptive management applied in response to needs, mid-term evaluation findings with lessons learned extracted.

### **3. OBJECTIVES OF THE MTR**

The MTR will assess progress towards the achievement of the project objectives and outcomes as specified in the Project Document, and assess early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. The MTR will also review the project's strategy and its risks to sustainability.

## 4. MTR APPROACH & METHODOLOGY

The MTR must provide evidence based information that is credible, reliable and useful. The MTR team will review all relevant sources of information including documents prepared during the preparation phase (i.e. PIF, UNDP Initiation Plan, UNDP Environmental & Social Safeguard Policy, the Project Document, project reports including Annual Project Review/PIRs, project budget revisions, lesson learned reports, national strategic and legal documents, and any other materials that the team considers useful for this evidence-based review). The MTR team will review the baseline GEF focal area Tracking Tool submitted to the GEF at CEO endorsement, and the midterm GEF focal area Tracking Tool that must be completed before the MTR field mission begins.

The MTR team is expected to follow a collaborative and participatory approach<sup>12</sup> ensuring close engagement with the Project Team, government counterparts (the GEF Operational Focal Point), the UNDP Country Office(s), UNDP-GEF Regional Technical Advisers, and other key stakeholders.

Engagement of stakeholders is vital to a successful MTR.<sup>13</sup> Stakeholder involvement should include interviews with stakeholders who have project responsibilities, including but not limited to Ministry of Industry, Ministry of Forestry and Environment, Manufacturer Association, Recycling Association; executing agencies, senior officials and task team/ component leaders, key experts and consultants in the subject area, Project Board, project stakeholders, academia, local government and CSOs, etc. Additionally, the MTR team is expected to conduct field missions to West Java and East Java, including the following project sites Bekasi, Cirebon and Surabaya.

The final MTR report should describe the full MTR approach taken and the rationale for the approach making explicit the underlying assumptions, challenges, strengths and weaknesses about the methods and approach of the review.

## 5. DETAILED SCOPE OF THE MTR

The MTR team will assess the following four categories of project progress. See the [Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects](#) for extended descriptions.

### i. Project Strategy

Project design:

- Review the problem addressed by the project and the underlying assumptions. Review the effect of any incorrect assumptions or changes to the context to achieving the project results as outlined in the Project Document.
- Review the relevance of the project strategy and assess whether it provides the most effective route towards expected/intended results. Were lessons from other relevant projects properly incorporated into the project design?
- Review how the project addresses country priorities. Review country ownership. Was the project concept in line with the national sector development priorities and plans of the country (or of participating countries in the case of multi-country projects)?

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<sup>12</sup> For ideas on innovative and participatory Monitoring and Evaluation strategies and techniques, see [UNDP Discussion Paper: Innovations in Monitoring & Evaluating Results](#), 05 Nov 2013.

<sup>13</sup> For more stakeholder engagement in the M&E process, see the [UNDP Handbook on Planning, Monitoring and Evaluating for Development Results](#), Chapter 3, pg. 93.

- Review decision-making processes: were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process, taken into account during project design processes?
- Review the extent to which relevant gender issues were raised in the project design. See Annex 9 of *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for further guidelines.
- If there are major areas of concern, recommend areas for improvement.

Results Framework/Logframe:

- Undertake a critical analysis of the project’s logframe indicators and targets, assess how “SMART” the midterm and end-of-project targets are (Specific, Measurable, Attainable, Relevant, Time-bound), and suggest specific amendments/revisions to the targets and indicators as necessary.
- Are the project’s objectives and outcomes or components clear, practical, and feasible within its time frame?
- Examine if progress so far has led to, or could in the future catalyse beneficial development effects (i.e. income generation, gender equality and women’s empowerment, improved governance etc...) that should be included in the project results framework and monitored on an annual basis.
- Ensure broader development and gender aspects of the project are being monitored effectively. Develop and recommend SMART ‘development’ indicators, including sex-disaggregated indicators and indicators that capture development benefits.

**ii. Progress Towards Results**

Progress Towards Outcomes Analysis:

- Review the logframe indicators against progress made towards the end-of-project targets using the Progress Towards Results Matrix and following the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects*; colour code progress in a “traffic light system” based on the level of progress achieved; assign a rating on progress for each outcome; make recommendations from the areas marked as “Not on target to be achieved” (red).

**Table. Progress Towards Results Matrix (Achievement of outcomes against End-of-project Targets)**

Project Strategy	Indicator <sup>14</sup>	Baseline Level <sup>15</sup>	Level in 1 <sup>st</sup> PIR (self-reported)	Midterm Target <sup>16</sup>	End-of-project Target	Midterm Level & Assessment <sup>17</sup>	Achievement Rating <sup>18</sup>	Justification for Rating
<b>Objective:</b>	Indicator (if applicable):							
<b>Outcome 1:</b>	Indicator 1:							
	Indicator 2:							
	Indicator 3:							

<sup>14</sup> Populate with data from the Logframe and scorecards

<sup>15</sup> Populate with data from the Project Document

<sup>16</sup> If available

<sup>17</sup> Colour code this column only

<sup>18</sup> Use the 6 point Progress Towards Results Rating Scale: HS, S, MS, MU, U, HU

Outcome 2:	Indicator 4:							
	Etc.							
Etc.								

**Indicator Assessment Key**

Green= Achieved	Yellow= On target to be achieved	Red= Not on target to be achieved
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In addition to the progress towards outcomes analysis:

- Compare and analyse the GEF Tracking Tool at the Baseline with the one completed right before the Midterm Review.
- Identify remaining barriers to achieving the project objective in the remainder of the project.
- By reviewing the aspects of the project that have already been successful, identify ways in which the project can further expand these benefits.

**iii. Project Implementation and Adaptive Management**

Management Arrangements:

- Review overall effectiveness of project management as outlined in the Project Document. Have changes been made and are they effective? Are responsibilities and reporting lines clear? Is decision-making transparent and undertaken in a timely manner? Recommend areas for improvement.
- Review the quality of execution of the Executing Agency/Implementing Partner(s) and recommend areas for improvement.
- Review the quality of support provided by the GEF Partner Agency (UNDP) and recommend areas for improvement.

Work Planning:

- Review any delays in project start-up and implementation, identify the causes and examine if they have been resolved.
- Are work-planning processes results-based? If not, suggest ways to re-orientate work planning to focus on results?
- Examine the use of the project’s results framework/ logframe as a management tool and review any changes made to it since project start.

Finance and co-finance:

- Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions.
- Review the changes to fund allocations as a result of budget revisions and assess the appropriateness and relevance of such revisions.
- Does the project have the appropriate financial controls, including reporting and planning, that allow management to make informed decisions regarding the budget and allow for timely flow of funds?
- Informed by the co-financing monitoring table to be filled out, provide commentary on co-financing: is co-financing being used strategically to help the objectives of the project? Is the Project Team meeting with all co-financing partners regularly in order to align financing priorities and annual work plans?

#### Project-level Monitoring and Evaluation Systems:

- Review the monitoring tools currently being used: Do they provide the necessary information? Do they involve key partners? Are they aligned or mainstreamed with national systems? Do they use existing information? Are they efficient? Are they cost-effective? Are additional tools required? How could they be made more participatory and inclusive?
- Examine the financial management of the project monitoring and evaluation budget. Are sufficient resources being allocated to monitoring and evaluation? Are these resources being allocated effectively?

#### Stakeholder Engagement:

- Project management: Has the project developed and leveraged the necessary and appropriate partnerships with direct and tangential stakeholders?
- Participation and country-driven processes: Do local and national government stakeholders support the objectives of the project? Do they continue to have an active role in project decision-making that supports efficient and effective project implementation?
- Participation and public awareness: To what extent has stakeholder involvement and public awareness contributed to the progress towards achievement of project objectives?

#### Reporting:

- Assess how adaptive management changes have been reported by the project management and shared with the Project Board.
- Assess how well the Project Team and partners undertake and fulfil GEF reporting requirements (i.e. how have they addressed poorly-rated PIRs, if applicable?)
- Assess how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.

#### Communications:

- Review internal project communication with stakeholders: Is communication regular and effective? Are there key stakeholders left out of communication? Are there feedback mechanisms when communication is received? Does this communication with stakeholders contribute to their awareness of project outcomes and activities and investment in the sustainability of project results?
- Review external project communication: Are proper means of communication established or being established to express the project progress and intended impact to the public (is there a web presence, for example? Or did the project implement appropriate outreach and public awareness campaigns?)
- For reporting purposes, write one half-page paragraph that summarizes the project's progress towards results in terms of contribution to sustainable development benefits, as well as global environmental benefits.

#### **iv. Sustainability**

- Validate whether the risks identified in the Project Document, Annual Project Review/PIRs and the ATLAS Risk Management Module are the most important and whether the risk ratings applied are appropriate and up to date. If not, explain why.
- In addition, assess the following risks to sustainability:

#### Financial risks to sustainability:

- What is the likelihood of financial and economic resources not being available once the GEF assistance ends (consider potential resources can be from multiple sources, such as the public and private sectors, income generating activities, and other funding that will be adequate financial resources for sustaining project's outcomes)?

Socio-economic risks to sustainability:

- Are there any social or political risks that may jeopardize sustainability of project outcomes? What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long term objectives of the project? Are lessons learned being documented by the Project Team on a continual basis and shared/ transferred to appropriate parties who could learn from the project and potentially replicate and/or scale it in the future?

Institutional Framework and Governance risks to sustainability:

- Do the legal frameworks, policies, governance structures and processes pose risks that may jeopardize sustenance of project benefits? While assessing this parameter, also consider if the required systems/ mechanisms for accountability, transparency, and technical knowledge transfer are in place.

Environmental risks to sustainability:

- Are there any environmental risks that may jeopardize sustenance of project outcomes?

## Conclusions & Recommendations

The MTR team will include a section of the report setting out the MTR’s evidence-based conclusions, in light of the findings.<sup>19</sup>

Recommendations should be succinct suggestions for critical intervention that are specific, measurable, achievable, and relevant. A recommendation table should be put in the report’s executive summary. See the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for guidance on a recommendation table.

The MTR team should make no more than 15 recommendations total.

## Ratings

The MTR team will include its ratings of the project’s results and brief descriptions of the associated achievements in a *MTR Ratings & Achievement Summary Table* in the Executive Summary of the MTR report. See Annex E for ratings scales. No rating on Project Strategy and no overall project rating is required.

Table. MTR Ratings & Achievement Summary Table for (PBDEs & UPOPs)

Measure	MTR Rating	Achievement Description
Project Strategy	N/A	
Progress Towards Results	Objective Achievement Rating: (rate 6 pt. scale)	

<sup>19</sup> Alternatively, MTR conclusions may be integrated into the body of the report.

	Outcome 1 Achievement Rating: (rate 6 pt. scale)	
	Outcome 2 Achievement Rating: (rate 6 pt. scale)	
	Outcome 3 Achievement Rating: (rate 6 pt. scale)	
	Etc.	
<b>Project Implementation &amp; Adaptive Management</b>	(rate 6 pt. scale)	
<b>Sustainability</b>	(rate 4 pt. scale)	

## 6. TIMEFRAME

The total duration of the MTR will be approximately 25 working days over a time period of 14 of weeks, and shall not exceed five months from when the consultant(s) are hired. The tentative MTR timeframe is as follows:

ACTIVITY	NUMBER OF WORKING DAYS	COMPLETION DATE
Document review and preparing MTR Inception Report (MTR Inception Report due no later than 2 weeks before the MTR mission)	3 days	7 February 2019
MTR mission: stakeholder meetings, interviews, field visits	7 days	25 February 2019
Presentation of initial findings- last day of the MTR mission	1 day	26 February 2019
Preparing draft report (due within 3 weeks of the MTR mission)	10 days	29 March 2019
Finalization of MTR report/ Incorporating audit trail from feedback on draft report (due within 2 weeks of receiving UNDP comments on the draft) <i>(note: accommodate time delay in dates for circulation and review of the draft report)</i>	4 days	17 May 2019

Options for site visits should be provided in the Inception Report. Also, note that the international consultant shall give a measure of direction from the national consultant to ensure timely collection of data and information on the ground and overall inputs to various written deliverables.

## 7. MIDTERM REVIEW DELIVERABLES

#	Deliverable	Description	Timing	Responsibilities
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1	<b>MTR Inception Report</b>	MTR team clarifies objectives and methods of Midterm Review	No later than 1 weeks before the MTR mission (due date: 7 February 2019)	MTR team submits to the Commissioning Unit and project management
2	<b>Presentation</b>	Initial Findings	End of MTR mission (due date: 26 February 2019)	MTR Team presents to project management and the Commissioning Unit
3	<b>Draft Final Report</b>	Full report (using guidelines on content outlined in Annex B) with annexes	Within 3 weeks of the MTR mission (due date: 29 March 2019)	Sent to the Commissioning Unit, reviewed by RTA, Project Coordinating Unit, GEF OFP
4	<b>Final Report*</b>	Revised report with audit trail detailing how all received comments have (and have not) been addressed in the final MTR report	Within 2 weeks of receiving UNDP comments on draft (due date: 17 May 2019)	Sent to the Commissioning Unit

\*The final MTR report must be in English. If applicable, the Commissioning Unit may choose to arrange for a translation of the report into a language more widely shared by national stakeholders.

## 8. MTR ARRANGEMENTS

The principal responsibility for managing this MTR resides with the Commissioning Unit. The Commissioning Unit for this project's MTR is *the UNDP Indonesia Country Office*.

The commissioning unit will contract the consultants and ensure the timely provision of per diems and travel arrangements within the country of Indonesia for the MTR team. The Project Team will be responsible for liaising with the MTR team to provide all relevant documents, set up stakeholder interviews, and arrange field visits.

## 9. TEAM COMPOSITION

A team of two independent consultants (international and national consultants) will conduct the MTR - one team leader (with experience and exposure to projects and evaluations in other regions globally) and one team expert, usually from the country of the project. The consultants cannot have participated in the project preparation, formulation, and/or implementation (including the writing of the Project Document) and should not have a conflict of interest with project's related activities.

The selection of consultants will be aimed at maximizing the overall "team" qualities in the following areas:

1. Recent experience with result-based management evaluation methodologies (10 marks);
2. Experience applying SMART indicators and reconstructing or validating baseline scenarios for at least 7 years (10 marks);

3. Competence in adaptive management, especially on hazardous chemicals or Persistent Organic Pollutants (POPs) (10 marks);
4. Experience working with the GEF or GEF-evaluations for at least 5 years (5 marks);
5. Experience working in **Asia-Pacific Countries** for at least 3 years (5 marks)
6. Work experience in relevant technical areas for at least **15 years** including experience on project monitoring and evaluation (10 marks);
7. Demonstrated understanding of issues related to gender and *hazardous chemicals*; experience in gender sensitive evaluation and analysis (10 marks);
8. Excellent communication skills (10 marks);
9. Demonstrable analytical skills (10 marks);
10. Project evaluation/review experiences within United Nations system will be considered an asset (10 marks);
11. A Master's degree in chemical science, chemical engineering, natural science, environment science, environmental engineering, or other closely related field (10 marks);

## 10. PAYMENT MODALITIES AND SPECIFICATIONS

10% of payment upon approval of the final MTR Inception Report  
 30% on presentation of findings  
 30% upon submission of the draft MTR report  
 30% upon finalization of the MTR report

## 11. APPLICATION PROCESS<sup>20</sup>

### Recommended Presentation of Proposal:

- a) **Letter of Confirmation of Interest and Availability** using the [template](#)<sup>21</sup> provided by UNDP;
- b) **CV** and a **Personal History Form (P11 form)**<sup>22</sup>;
- c) **Brief description of approach to work/technical proposal** of why the individual considers him/herself as the most suitable for the assignment, and a proposed methodology on how they will approach and complete the assignment; (max 1 page)
- d) **Financial Proposal** that indicates the all-inclusive fixed total contract price and all other travel related costs (such as flight ticket, per diem, etc), supported by a breakdown of costs, as per template attached to the [Letter of Confirmation of Interest template](#). If an applicant is employed by an organization/company/institution, and he/she expects his/her employer to charge a management fee in the process of releasing him/her to UNDP under Reimbursable Loan Agreement (RLA), the applicant must indicate at this point, and ensure that all such costs are duly incorporated in the financial proposal submitted to UNDP.

All application materials should be submitted to the address **United Nations Development Programme, Menara Thamrin 8-9th Floor. Jl. MH Thamrin Kav.3 Jakarta 10250, Indonesia**; in a sealed envelope indicating the following reference **“Consultant for PBDEs & UPOPs Midterm Review”** or by email at the following

<sup>20</sup> Engagement of the consultants should be done in line with guidelines for hiring consultants in the POPP:  
<https://info.undp.org/global/popp/Pages/default.aspx>

<sup>21</sup>

<https://intranet.undp.org/unit/bom/pso/Support%20documents%20on%20IC%20Guidelines/Template%20for%20Confirmation%20of%20Interest%20and%20Submission%20of%20Financial%20Proposal.docx>

<sup>22</sup> [http://www.undp.org/content/dam/undp/library/corporate/Careers/P11\\_Personal\\_history\\_form.doc](http://www.undp.org/content/dam/undp/library/corporate/Careers/P11_Personal_history_form.doc)

address ONLY: yusef.millah@undp.org by **23 November 2018**. Incomplete applications will be excluded from further consideration.

**Criteria for Evaluation of Proposal:** Only those applications which are responsive and compliant will be evaluated. Offers will be evaluated according to the Combined Scoring method – where the educational background and experience on similar assignments will be weighted at 70% and the price proposal will weigh as 30% of the total scoring. The applicant receiving the Highest Combined Score that has also accepted UNDP’s General Terms and Conditions will be awarded the contract.

## **ToR ANNEX A: List of Documents to be reviewed by the MTR Team**

1. UNDP Project Document
2. UNDP Environmental and Social Screening results
3. Project Inception Report
4. All Project Implementation Reports (PIR’s)
5. Quarterly progress reports and work plans of the various implementation task teams
6. Audit reports
7. Finalized GEF focal area Tracking Tools at CEO endorsement and midterm
8. All monitoring reports prepared by the project
9. Financial and Administration guidelines used by Project Team
10. PIF
11. UNDP Initiation Plan
12. Oversight mission reports
13. Project site location maps

The following documents will also be available:

14. Project Standard Operational Procedure (SOP), and any other operational guidelines, manuals and systems
15. UNDP country/countries programme document(s)
16. Minutes of the PBDEs & POPs Board Meetings

## **ToR ANNEX B: Guidelines on Contents for the Midterm Review Report<sup>23</sup>**

- i. Basic Report Information (*for opening page or title page*)
  - Title of UNDP supported GEF financed project
  - UNDP PIMS# and GEF project ID#
  - MTR time frame and date of MTR report
  - Region and countries included in the project
  - GEF Operational Focal Area/Strategic Program
  - Executing Agency/Implementing Partner and other project partners
  - MTR team members
  - Acknowledgements
- ii. Table of Contents
- iii. Acronyms and Abbreviations
1. Executive Summary (*3-5 pages*)
  - Project Information Table
  - Project Description (brief)
  - Project Progress Summary (between 200-500 words)
  - MTR Ratings & Achievement Summary Table
  - Concise summary of conclusions

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<sup>23</sup> The Report length should not exceed **40** pages in total (not including annexes).

- Recommendation Summary Table
2. Introduction (2-3 pages)
    - Purpose of the MTR and objectives
    - Scope & Methodology: principles of design and execution of the MTR, MTR approach and data collection methods, limitations to the MTR
    - Structure of the MTR report
  3. Project Description and Background Context (3-5 pages)
    - Development context: environmental, socio-economic, institutional, and policy factors relevant to the project objective and scope
    - Problems that the project sought to address: threats and barriers targeted
    - Project Description and Strategy: objective, outcomes and expected results, description of field sites (if any)
    - Project Implementation Arrangements: short description of the Project Board, key implementing partner arrangements, etc.
    - Project timing and milestones
    - Main stakeholders: summary list
  4. Findings (12-14 pages)
    - 4.1 Project Strategy
      - Project Design
      - Results Framework/Logframe
    - 4.2 Progress Towards Results
      - Progress towards outcomes analysis
      - Remaining barriers to achieving the project objective
    - 4.3 Project Implementation and Adaptive Management
      - Management Arrangements
      - Work planning
      - Finance and co-finance
      - Project-level monitoring and evaluation systems
      - Stakeholder engagement
      - Reporting
      - Communications
    - 4.4 Sustainability
      - Financial risks to sustainability
      - Socio-economic to sustainability
      - Institutional framework and governance risks to sustainability
      - Environmental risks to sustainability
  5. Conclusions and Recommendations (4-6 pages)
    - 5.1 Conclusions
      - Comprehensive and balanced statements (that are evidence-based and connected to the MTR's findings) which highlight the strengths, weaknesses and results of the project
    - 5.2 Recommendations
      - Corrective actions for the design, implementation, monitoring and evaluation of the project
      - Actions to follow up or reinforce initial benefits from the project
      - Proposals for future directions underlining main objectives

6. Annexes

- MTR ToR (excluding ToR annexes)
- MTR evaluative matrix (evaluation criteria with key questions, indicators, sources of data, and methodology)
- Example Questionnaire or Interview Guide used for data collection
- Ratings Scales
- MTR mission itinerary
- List of persons interviewed
- List of documents reviewed
- Co-financing table (if not previously included in the body of the report)
- Signed UNEG Code of Conduct form
- Signed MTR final report clearance form
- *Annexed in a separate file:* Audit trail from received comments on draft MTR report
- *Annexed in a separate file:* Relevant midterm tracking tools (*METT, FSC, Capacity scorecard, etc.*)

## ToR ANNEX C: Midterm Review Evaluative Matrix Template

This Midterm Review Evaluative Matrix must be fully completed by the consultant and included in the MTR inception report and as an Annex to the MTR report.

Evaluative Questions	Indicators	Sources	Methodology
<b>Project Strategy: To what extent is the project strategy relevant to country priorities, country ownership, and the best route towards expected results?</b>			
(include evaluative question(s))	(i.e. relationships established, level of coherence between project design and implementation approach, specific activities conducted, quality of risk mitigation strategies, etc.)	(i.e. project documents, national policies or strategies, websites, project staff, project partners, data collected throughout the MTR mission, etc.)	(i.e. document analysis, data analysis, interviews with project staff, interviews with stakeholders, etc.)
<b>Progress Towards Results: To what extent have the expected outcomes and objectives of the project been achieved thus far?</b>			
<b>Project Implementation and Adaptive Management: Has the project been implemented efficiently, cost-effectively, and been able to adapt to any changing conditions thus far? To what extent are project-level monitoring and evaluation systems, reporting, and project communications supporting the project's implementation?</b>			

<b>Sustainability: To what extent are there financial, institutional, socio-economic, and/or environmental risks to sustaining long-term project results?</b>			

**Evaluators/Consultants:**

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study limitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

**MTR Consultant Agreement Form**

Agreement to abide by the Code of Conduct for Evaluation in the UN System:

Name of Consultant: \_\_\_\_\_

Name of Consultancy Organization (where relevant): \_\_\_\_\_

**I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.**

Signed at \_\_\_\_\_ (*Place*) on \_\_\_\_\_ (*Date*)

Signature: \_\_\_\_\_

<sup>24</sup> <http://www.unevaluation.org/document/detail/100>

## ToR ANNEX E: MTR Ratings

<b>Ratings for Progress Towards Results:</b> (one rating for each outcome and for the objective)		
6	Highly Satisfactory (HS)	The objective/outcome is expected to achieve or exceed all its end-of-project targets, without major shortcomings. The progress towards the objective/outcome can be presented as “good practice”.
5	Satisfactory (S)	The objective/outcome is expected to achieve most of its end-of-project targets, with only minor shortcomings.
4	Moderately Satisfactory (MS)	The objective/outcome is expected to achieve most of its end-of-project targets but with significant shortcomings.
3	Moderately Unsatisfactory (HU)	The objective/outcome is expected to achieve its end-of-project targets with major shortcomings.
2	Unsatisfactory (U)	The objective/outcome is expected not to achieve most of its end-of-project targets.
1	Highly Unsatisfactory (HU)	The objective/outcome has failed to achieve its midterm targets, and is not expected to achieve any of its end-of-project targets.

<b>Ratings for Project Implementation &amp; Adaptive Management:</b> (one overall rating)		
6	Highly Satisfactory (HS)	Implementation of all seven components – management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation systems, stakeholder engagement, reporting, and communications – is leading to efficient and effective project implementation and adaptive management. The project can be presented as “good practice”.
5	Satisfactory (S)	Implementation of most of the seven components is leading to efficient and effective project implementation and adaptive management except for only few that are subject to remedial action.
4	Moderately Satisfactory (MS)	Implementation of some of the seven components is leading to efficient and effective project implementation and adaptive management, with some components requiring remedial action.
3	Moderately Unsatisfactory (MU)	Implementation of some of the seven components is not leading to efficient and effective project implementation and adaptive, with most components requiring remedial action.
2	Unsatisfactory (U)	Implementation of most of the seven components is not leading to efficient and effective project implementation and adaptive management.
1	Highly Unsatisfactory (HU)	Implementation of none of the seven components is leading to efficient and effective project implementation and adaptive management.

<b>Ratings for Sustainability:</b> (one overall rating)		
4	Likely (L)	Negligible risks to sustainability, with key outcomes on track to be achieved by the project’s closure and expected to continue into the foreseeable future
3	Moderately Likely (ML)	Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Midterm Review

2	Moderately Unlikely (MU)	Significant risk that key outcomes will not carry on after project closure, although some outputs and activities should carry on
1	Unlikely (U)	Severe risks that project outcomes as well as key outputs will not be sustained

**ToR ANNEX F: MTR Report Clearance Form**

*(to be completed by the Commissioning Unit and UNDP-GEF RTA and included in the final document)*

<p><b>Midterm Review Report Reviewed and Cleared By:</b></p>	
<p><b>Commissioning Unit</b></p>	
<p>Name: _____</p>	
<p>Signature: _____</p>	<p>Date: _____</p>
<p><b>UNDP-GEF Regional Technical Advisor</b></p>	
<p>Name: _____</p>	
<p>Signature: _____</p>	<p>Date: _____</p>

**ToR ANNEX G: Audit Trail Template**

*Note:* The following is a template for the MTR Team to show how the received comments on the draft MTR report have (or have not) been incorporated into the final MTR report. This audit trail should be included as an annex in the final MTR report.

**To the comments received on (date) from the Midterm Review of (PBDEs & UPOPs) (UNDP Project ID-PIMS #5073)**

*The following comments were provided in track changes to the draft Midterm Review report; they are referenced by institution (“Author” column) and track change comment number (“#” column):*

Author	#	Para No./ comment location	Comment/Feedback on the draft MTR report	MTR team response and actions taken

**6.2. MTR EVALUATIVE MATRIX (EVALUATION CRITERIA WITH KEY QUESTIONS, INDICATORS, SOURCES OF DATA, AND METHODOLOGY)**

<b>Evaluation questions</b>	<b>Proposed methodology / additional questions.</b>
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Review any delays in project start-up and implementation, identify the causes and examine if they have been resolved.	Analysis of IR, PIR and QMR. Interview with the Project Management Office.
Are work-planning processes results-based? If not, suggest ways to re-orientate work planning to focus on results?	Are work-planning processes technically oriented? Is work-planning integrating the views of technically-informed people (international and national experts)?
Examine the use of the project's results framework/ logframe as a management tool and review any changes made to it since project start.	Analysis of IR, PIR and QMR against indicators.
	Are the views of technical experts (national and international) properly considered in the process of work planning?

Table 10: Finance and co-finance evaluation questions

<b>Evaluation questions</b>	<b>Proposed methodology / additional questions.</b>
Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions.	This need an analysis of TOR and contracts developed and signed under the project, and the process leading to awarding and contracts. A detailed analysis of the cost-effectiveness under the MTR is not realistic.
Review the changes to fund allocations as a result of budget revisions and assess the appropriateness and relevance of such revisions.	To be discussed with UNDP and PMO. The QMR and PIR do not contain the necessary information to address this point.
Does the project have the appropriate financial controls, including reporting and planning, that allow management to make informed decisions regarding the budget and allow for timely flow of funds?	To be discussed with UNDP and PMO. The QMR and PIR do not contain the necessary information to address this point.
Informed by the co-financing monitoring table to be filled out, provide commentary on co-financing: is co-financing being used strategically to help the objectives of the project? Is the Project Team meeting with all co-financing partners regularly in order to align financing priorities and annual work plans?	To be discussed with UNDP and PMO. The QMR and PIR do not contain the necessary information to address this point

Table 11: Project-level Monitoring and Evaluation Systems: evaluation questions

<b>Evaluation questions</b>	<b>Proposed methodology / additional questions.</b>
Review the monitoring tools currently being used: Do they provide the necessary information? Do they involve key partners? Are they aligned or mainstreamed with national systems? Do they use existing information? Are they efficient? Are they cost-effective? Are additional tools required? How could they be made more participatory and inclusive?	To be discussed with UNDP, PMO and PSC.
Examine the financial management of the project monitoring and evaluation budget. Are sufficient resources being allocated to monitoring and evaluation? Are these resources being allocated effectively?	Analysis of project document and assignments on M&E under implementation. Meeting with officers in charge of project monitoring.
	Is the project management continuously interacting with national and international technical experts on the relevant matters to monitor the level of achievement of technical objectives? Are qualified international experts involved in project implementation beyond training activities?

Table 12: Evaluation questions on stakeholder engagement:

<b>Evaluation questions</b>	<b>Proposed methodology / additional questions.</b>
Project management: Has the project developed and leveraged the necessary and appropriate partnerships with direct and tangential stakeholders?	The term “tangential stakeholder” need to be clarified. Analysis of stakeholder and partnership at PPG and at implementation. Did the project ensured cooperation with the qualified technical partners? (i.e. Universities, Research Centers, Industries etc.)
Participation and country-driven processes: Do local and national government stakeholders support the objectives of the project? Do they continue to have an active role in project decision-making that supports efficient and effective project implementation?	Meetings with national and governmental stakeholders identified at PPG. Discussion aimed at understanding 1) their awareness of project activities and issues and 2) their actual involvement in project activities.

Participation and public awareness: To what extent has stakeholder involvement and public awareness contributed to the progress towards achievement of project objectives?	As a result of meetings with NGOs and national and governmental stakeholders.
	How the gender mainstreaming activities envisaged at project design have been implemented? Do women have access to information and opportunities generated by the project? Is the specific risk for women and children associated with PBDE plastic properly communicated to them?

Table 13: Evaluation questions on project reporting

<b>Evaluation questions</b>	<b>Proposed methodology / additional questions.</b>
Assess how adaptive management changes have been reported by the project management and shared with the Project Board.	From the PIRs, no evidence of adaptive management changes emerged. However, as the project is late on the achievement of the committed GEB, the assessment of needs of change will be undertaken. To be discussed with UNDP, PMO and PSC representatives.
Assess how well the Project Team and partners undertake and fulfil GEF reporting requirements (i.e. how have they addressed poorly-rated PIRs, if applicable?)	The evaluation will include assessment of the application of PIRs recommendation, as well as the assessment of PIR quality. At a first glance it seems that the issue of GEB achievement is overlooked in the PIR. To be discussed with UNDP, PMO and PSC representatives.
Assess how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.	From the PIRs, no evidence of adaptive management changes emerged.

Table 14: Evaluation questions on communications effectiveness

<b>Evaluation questions</b>	<b>Proposed methodology / additional questions.</b>
Review internal project communication with stakeholders: Is communication regular and effective? Are there key	Meetings with the stakeholders listed in the PIR, to understand their role, their

stakeholders left out of communication? Are there feedback mechanisms when communication is received? Does this communication with stakeholders contribute to their awareness of project outcomes and activities and investment in the sustainability of project results?	views and their involvement in project activities.
Review external project communication: Are proper means of communication established or being established to express the project progress and intended impact to the public (is there a web presence, for example? Or did the project implement appropriate outreach and public awareness campaigns?)	Review of awareness raising activities, development of a questionnaire survey to assess awareness increase as a result of project implementation if any, to understand the effectiveness of external project communication. Review the section on the PD on knowledge management.
For reporting purposes, write one half-page paragraph that summarizes the project's progress towards results in terms of contribution to sustainable development benefits, as well as global environmental benefits.	As the project is fully dedicated to the achievement of GEB and sustainable development benefits, that will be the main focus of all the evaluation, not only half a page.

Table 15: Interview template.

The following list of questions to be used as interview guidance was developed at inception. Not all the questions were asked during interview, partially because of time limitation and partially because in the course of interviews was clear that some questions were not relevant to the specific interviewed person.

**1    Contacts of interviewed person**

- 1.1 Name
- 1.2 Title
- 1.3 Role in the project
- 1.4 Affiliation
- 1.5 Email address
- 1.6 Phone

**2    Implementation approach**

- 2.1 Is the project Logical Framework properly communicated and being used as a management tool during implementation of the project at country level?
- 2.2 Are the project specific outputs and their corresponding indicators as defined in the project logical framework and design and its modification in the Inception report still relevant in the light of the project experience to date? Pinpoint any aspects of the “logframe” that shall be revisited and updated, and, if necessary, provide suggestion for timely changes or adjustment to activities and time-bound targets.

**Answer (no more than 50 words)**

- 2.3 List any change to the Logical Framework, the reason for the change, and how the change has been reported and reflected in the work plans
- 2.4 Describe how work plans for the management of project activities were routinely developed and updated;
- 2.5 Describe the electronic information technologies used to support implementation, participation and monitoring, as well as other project activities (including exchange with global project stakeholders). (for instance web based training, videoconferences, email, etc.)
- 2.6 Describe if and how the general operational relationships between institutions involved have contributed to effective implementation and achievement of project objectives.
- 2.7 Describe the technical capacities associated with the project and their role in project development, management and achievements.
- 2.8 Is the project's design adequate to address the problem(s) at hand?

**3 Monitoring and Evaluation**

- 3.1 Describe if and how the periodic oversight of activities during implementation has been performed.

**4 Stakeholder Participation**

**Answer (no more than 50 words)**

- 4.1 Are the information generated by the project properly disseminated at the country level, and how.
- 4.2 What are the NGOs operating in the field of waste in the country? Please list
- 4.3 How and if these NGOs participated in project design, implementation and decision making
- 4.4 How in your view participation of NGOs could be improved
- 4.5 How partnership and collaborative relationships developed by the project with local, national and international entities has been established, and the effects they have had on project implementation.
- 4.6 Which government institutions were involved in project implementation?
- 4.7 How government institutions were involved in project implementation?
- 4.8 To which extent the government supported the project?

**5 Sustainability**

**Answer (no more than 50 words)**

- 5.1 Has been a sustainability strategy implemented / planned? Describe it briefly
- 5.2 Are market condition favourable for the diffusion of the technologies / experiences for prevention of PBDE and plastic pollution in your country?
- 5.4 Have been economic / financial instruments established to sustain the segregation and disposal of POP contaminated plastic?

**6 Execution and implementation modalities**

**Answer (no more than 50 words)**

- 6.1 Describe how selection, recruitment, assignment of experts, consultants and national counterpart staff is performed
- 6.2 Describe how UNDP CO and Government collaborate together in the execution of the above tasks
- 6.3 Describe how tasks and responsibilities are assigned among the project stakeholders
- 6.4 (QUESTION ONLY FOR UNDP COs representatives) Quality and timeliness of inputs by UNDP - NY to the project, and the extent to which this may have affected the smooth implementation of the project
- 6.5 Quality and timeliness of inputs by Government to the project, and the extent to which this may have affected the smooth implementation of the project
- 6.6 Quality and timeliness of inputs and guidance by international experts (the Chief Technical Advisor, the Global Project Team) responsible for providing inputs to the project, and the extent to which this may have affected the smooth implementation of the project
- 6.7 Describe how enactment of necessary legislation / permits may have affected implementation of sustainability of the project
- 6.8 Describe how modality of budgetary provisions may have positively or negatively affected implementation and sustainability of the project

### 6.3. RATINGS SCALES

<b>Ratings for Progress Towards Results:</b> (one rating for each outcome and for the objective)		
6	Highly Satisfactory (HS)	The objective/outcome is expected to achieve or exceed all its end-of-project targets, without major shortcomings. The progress towards the objective/outcome can be presented as “good practice”.
5	Satisfactory (S)	The objective/outcome is expected to achieve most of its end-of-project targets, with only minor shortcomings.
4	Moderately Satisfactory (MS)	The objective/outcome is expected to achieve most of its end-of-project targets but with significant shortcomings.
3	Moderately Unsatisfactory (HU)	The objective/outcome is expected to achieve its end-of-project targets with major shortcomings.
2	Unsatisfactory (U)	The objective/outcome is expected not to achieve most of its end-of-project targets.
1	Highly Unsatisfactory (HU)	The objective/outcome has failed to achieve its midterm targets, and is not expected to achieve any of its end-of-project targets.

### **Ratings for Project Implementation & Adaptive Management:** (one overall rating)

6	Highly Satisfactory (HS)	Implementation of all seven components – management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation systems, stakeholder engagement, reporting, and communications – is leading to efficient and effective project implementation and adaptive management. The project can be presented as “good practice”.
5	Satisfactory (S)	Implementation of most of the seven components is leading to efficient and effective project implementation and adaptive management except for only few that are subject to remedial action.
4	Moderately Satisfactory (MS)	Implementation of some of the seven components is leading to efficient and effective project implementation and adaptive management, with some components requiring remedial action.
3	Moderately Unsatisfactory (MU)	Implementation of some of the seven components is not leading to efficient and effective project implementation and adaptive, with most components requiring remedial action.
2	Unsatisfactory (U)	Implementation of most of the seven components is not leading to efficient and effective project implementation and adaptive management.
1	Highly Unsatisfactory (HU)	Implementation of none of the seven components is leading to efficient and effective project implementation and adaptive management.

<b>Ratings for Sustainability:</b> (one overall rating)		
4	Likely (L)	Negligible risks to sustainability, with key outcomes on track to be achieved by the project’s closure and expected to continue into the foreseeable future
3	Moderately Likely (ML)	Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Midterm Review
2	Moderately Unlikely (MU)	Significant risk that key outcomes will not carry on after project closure, although some outputs and activities should carry on
1	Unlikely (U)	Severe risks that project outcomes as well as key outputs will not be sustained

#### 6.4. MTR MISSION ITINERARY

MTR Mission agenda as last agreed and communicated by UNCP CO with Email dated March 12, 2019. Limited amendments of this agenda were made on a daily basis following availability of the persons to be met and reflected in the meeting minutes.

<b>Date</b>	<b>Time</b>	<b>Resource Person</b>	<b>Location</b>
12 March 2019	10:00 – 12:00	a. Assistant Country Director UNDP Indonesia/ Head of Environment Unit UNDP Indonesia (Agus Wibowo) b. Programme Officer of Environment Unit UNDP Indonesia	UNDP, Menara Thamrin Building

		c. Gender and Reporting Officer UNDP d. PMU PBDEs & UPOPs	
	13:00 – 14:30	Directorate of Hazardous and Toxic Waste Management, Ministry of Environment and Forestry (KLHK)	KLHK
	15:00 – 16:00	Deputy of Engineering Sciences, Indonesian Institute of Sciences (LIPI)	LIPI (Indonesian Institute of Science)
13 March 2019	09:00 – 10:00	Head of Agency for Industrial Research and Development, Ministry of Industry (MoI) / NPD PBDEs & UPOPs  Secretary of Agency for Industrial Research and Development	MoI
	10:00 – 12:00	Discussion with AMC	Surveyor Indonesia Building
	14:00 – 16:00	a. APHINDO b. APDUPI c. PT. Interaneka	Surveyor Indonesia Building
14 March 2019	09:00 – 11:00	Visit to BBKK (Balai Besar Kimia dan Kemasan/Center for Chemicals and Packaging)	BBKK
	11:00 – 12:00	Directorate of Industry, Tourism and Creative Economy, Deputy of Economic Affairs, National Planning Development Agency (Bappenas)	Bappenas
	14:00 – 15:00	Directorate of Loan and Grant Directorate General of Financing and Risk Management, Ministry of Finance (Kemenkeu)	Kemenkeu
15 March 2019	06.15 – 07.30 09.30 – 15.00	Flight Jakarta to Surabaya	Mojokerto

		Field visit to Mini Depo Location in Tawang Sari, Mojokerto, and discussion Stay in Surabaya for a night	
16 March 2019	06.00 – 07.30 09.00 – 15.00 16:00 – 19:30	Flight from Surabaya to Cirebon Field visit to Mini Depo Location in Babakan, Cirebon, and discussion Travel to Jakarta by train	
18 March 2019	10.00 – 11.00	GEF Operational Focal Point	KLHK Blok 1
19 March 2019	09:00 – 12:00	Coordination meeting with relevant resource person from relevant stakeholders	Hotel Gran Melia Jakarta

#### 6.5. MTR MEETING MINUTES

Date March 12, 2019		
Time: 9:30		
Venue: Ministry of Environment and Forests		
Participants	Affiliation	Email
Ibu Yun Indiani	MOEF	
Bu Rosalind R.	MOEF	
Linda Yanti Sulistiawati	MTR consultant-national	<a href="mailto:lindayanti@ugm.ac.id">lindayanti@ugm.ac.id</a>
Carlo Lupi	MTR consultant-international	<a href="mailto:carlolupi@popchemicals.org">carlolupi@popchemicals.org</a>
Kurnia Hanafiah	UNDP Jakarta	<a href="mailto:kurnia.hanafiah@undp.org">kurnia.hanafiah@undp.org</a>
Harti Ningsih	UNDP Jakarta	<a href="mailto:harti.ningsih@undp.org">harti.ningsih@undp.org</a>
Topic of the meeting	Meeting with KLHK/ MOEF—Indonesia focal point for Stockholm Convention on UPOPs	
Meeting minute		

Ibu Yun: MOEF wants to put PBDE in the regulation, therefore we expect recommendations from the project on how to manage PBDE waste. We are preparing for the COP, therefore this is the correct time for the evaluation.

Question: How MoE is involved in the issue of plastic recycling and POPs and how do you think the project can support MoE in achieving its goal?

Answer: MOEF is only involved in health and environment issues. We have some conflicts with the MOI as obviously - our mandate is different – they see the problem from the point of view of use of chemicals. We see the problem from the point of view of risks.

Question: Was MoE involved in project design?

Answer: Yes, we were involved.

Question: Is the project's design still adequate to address the problem(s) at hand?

Answer: Yes, it is still adequate.

Question: Describe if and how the general operational relationships between institutions involved have contributed to effective implementation and achievement of project objectives.

Answer: The project has a good relationship with UNDP. We are in charge of the substances from the point of view of Health. MOI is in charge of manufacturing. On the regulatory issue, however, we have a deadlock since 2 years due to different views with MOI. Currently there are 28 UPOPS ban, PP 74/2001 is under review and we would like to include PBDE and PCB in that review. MOEF Strongly support the project, KLHK considers there should be a ministerial regulation to regulate and manage POP waste. PP 74/2001 establishes mandatory rules for importation of substance to Indonesia, importers have to register the substance to Indonesia: inspection, use of chemicals, and risks. KLHK is in the process of revision of the Ministerial Environment Regulation 74/2001 on POPs' Annex to include PBDE. The current MOE Annex is on 9 traditional UPOPS, and the revision will include the rest of 12 UPOPS, including PBDE.

Concerning the PP 101/2014 on Management of the so called B3 Hazardous waste management, the target entity are the producers. That is why the MOEF strongly supports the EPR (producers responsible to the waste of their product).

Question: Will this be resolved before the project ends? Answer: After April 2019, due to the coming general elections.

Question: What are the key issues in project implementation?

Answer: EPR has to be established. The discussion on how to dispose hazardous waste did not start yet. It's very important to coordinate on the disposal of PBDEs! However, the Ministry did not undertake yet any discussion on how to dispose the PBDE plastic after it has been segregated.

Question: What is the role of MOEF on recruitment and project execution? Answer: MOEF has no role on that.

Sustainability: MOEF is following project for facility of disposing PBDE (landfill or incineration with high temperature).

Other technology hasn't appear yet.

Which is the recommended policy to treat PBDE? Answer: we are just waiting for inputs from UNDP/Project.

MOEF is a national focal point for 3 conventions—including Stockholm Convention on UPOPS, to put into the plan. Eq preparing Presidential decree on PoPs under Stockholm Convention, 2019 but finalization in 2020.

NGO: plastic waste directorate is different with this directorate. Informal recycler NGOs, no information in MOEF. We would like to make them formal. Government needs to give them room and legalize these informal people. 7000 waste banks are currently under the guidance of MOEF. -

Date March 12, 2019		
Time: 15:00		
Venue: Lembaga Ilmu Pengetahuan Indonesia (Indonesian Institute of Science) LIPI		
Participants	Affiliation	Email
BP. Agus Haryono	LIPI: Deputy Chairman of Engineering Sciences: Chemistry, Materials, Electronics and Clean Technology.	<a href="mailto:Agus.Haryono@lipi.go.id">Agus.Haryono@lipi.go.id</a>
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Topic of the meeting	Discussion on LIPI role in project implementation	
<p>LIPI doesn't directly join the project, but have conducted research with other institutions who are implementing the project. Not involved in the project design. The role of LIPI in the project is often to give advice and suggestions, as the resource person. He was involved 4 times in meetings and seminars all over Indonesia,</p> <p>Involvement of women is important as they are doing plastic electronic equipment recycling. Students are also very interested in this project, students do not know that electronic equipment contains PBDEs.</p> <p>Local government want to be involved in this project, participation of the gender in the solution for the recycling of PBDE in plastic. Central government (KLHK) support the project as the focal point of the Stockholm convention because they have to be involved in PBDE. NGO more thinking of effect of POPS, they do not advocate specific chemicals. Public do not respond to chemical issues.</p>		

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Date March 13, 2019		
Time: Morning		
Venue: Ministry of Industry		
Participants	Affiliation	Email
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Topic of the meeting	Views of the NPD and vice-NPD on project status.	
<p>The meeting started with a presentation from Mr. Ngakan, the NPD of the project, informing the background and progress of the project.</p> <p>As reported by NPD on management, in the beginning of the project, there were several hurdles. Project was placed in another DG in the ministry of Industry, and then moved to this DG (Research and Development of Industry). So there was a 6 months halt of the project, without any activities, hence it is good that somehow this project is on track.</p> <p>LOGFRAME: There were modification to the logframe, except on the import control and restriction of plastic PBDE, this is then replaced to self-control of the content of PBDE in plastic.</p> <p>How could the project achieve the target tonnage without knowing how to identify PBDE in plastic? Is the Logframe still valid?</p> <p>The NPD explained that the PBDE in plastic will be identified at mini depots. When they check and the plastic is free from PBDE, the plastic can go to the recycling process. One mini-depo has been built but not yet functional. Two additional mini-depots have to be built. Concerning the overall number of samples: totally, around 500 samples have been done with XRF, 32 found contaminated over 1000 ppm, 24 confirmed in the laboratory. Not all the laboratories have the capacity to perform this kind of analysis.</p> <p>In the view of NPD; the Logframe is still valid. Revisions might be needed (i.e. the number of mini depots) but other than that the project no needs further rearrangements.</p> <p>Question on the technical bylaw: How the project going to be able to enact this?</p> <p>Answer: There are several things the project can do:</p> <ol style="list-style-type: none"> <li>1. Immediately pushed for PP 74/2001 on the Management of Toxic and Hazardous Materials. Currently there is a deadlock between MoEF and Mol. MoEF is going to use not only PoPs in Stockholm, but also Basel and Rotterdam. This is confusing for Mol.</li> <li>2. Work faster on the Draft Mol Regulation on the Prohibition of PBDE in Indonesia's Products.</li> <li>3. PP 101/2001 there is already regulation for Toxic and Hazardous waste. No one can give assurance on whether option 1 or 2 will be able to be materialized during the project duration.</li> </ol>		

Date March 13, 2019		
Time: Afternoon		
Venue: Ministry of Industry		
Participants	Affiliation	Email
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Topic of the meeting	Discussion with NGOs and industry associations	
<p>APHINDO involvement in project. They were familiar with issues on PBDE since 2010. APHINDO is the association for plastic in Indonesia and all the members adhere to the standards of plastic free from PBDE in Indonesia. Is not sure whether members of APHINDO are still using PBDE as flame retardants. Discussion on possible replacement of PBDE as flame retardant is ongoing.</p> <p>INTERA – producing master batch. We already banned Deca-BDE but we are using DPBDE (Decabromodiphenylethane). We do not import DPBDE but we import master batch powder already treated with DPBDE. The only way to distinguish deca-BDE from DPBDE is through GC.MS. They have to rely on certification of the manufacturer.</p> <p>APDUPI – small scale Recycler. Members are collectors and processors – informal collectors are member of the association. The associations provides training for its associates– most of the informal actors of the recycling industry are however learning by doing. They collect all type of plastic – to classify the type of plastic, they burn a small fragment of the plastic and recognize it by smell. Most of their activity is very dangerous and most of their associates are not aware of the risk. The project is collaborating with their associations. Problems in the field are:</p> <ul style="list-style-type: none"> <li>• PBDE identification and identification of types of plastic;</li> <li>• Lack of awareness of health and safety and environmental safety;</li> <li>• Lack of knowledge on new raw materials.</li> <li>• Garbage separation from the point source (households and industry).</li> </ul> <p>APDUPI's raw materials are from: Palembang, Lampung, Lombok, Makassar, Jawa Timur (East Java), Jawa Tengah (Central Java), Jabodetabek (Metropolitan Jakarta).</p> <p>Current prices: Collector, net profit Rp.1,000/kg; 5 ton/day, plastic: 1 ton/day  Crusher, net profit Rp. 500/kg : 1ton/day  Pelletizing, net profit Rp. 1,000/kg : 1ton/day</p> <p>Did your associates attend the training? Out of over 200 members only 10 deal with that plastic. The price of this kind of plastic is as follows: Other plastic 1500 idr/kg; HDP plastic 11,000 idr/kg. The plastic which is not recycled is burned</p>		

or delivered to the landfill. Most of our associates are family firms. When the price is getting low, they keep plastic in storage. Very often plastic contain water or other stuff but in this case, it is paid less. The annual fee to join the association is around 400000 IDR (around 50 USD). For communication we have a Whatsapp group. We provide information on the market of plastic by means of Whatsapp.

How to identify plastic containing PBDE – what are they going to do with plastic containing PBDE: Segregation usually is done by women. There is the habit to burn plastic to identify what type of plastic is this. Women are also doing this type of “analysis”. One of their members identifying plastic recently developed brain cancer and died. They also process plastic from the automotive sector.

Project introduced identification of PBDE and dangers of PBDE to the members of APDUPI. The recycling industry is a priority for the Government of Indonesia, so the associations can easily get support from many ministries: MOELF, MOI, State Department, etc.

APHINDO Other association (the one with formal associates) represents the associates in front of the government. The law is highlighting of reduction of plastic bag. We communicate through email.

Time: 14/03/2019		
Venue: Ministry of Industry		
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Topic of the meeting	Discussion on the role of AMC in project implementation	

In the beginning AMC reviewed international documents on recycling – for instance the ones developed by UNEP. In the second step AMC visited companies –several very small company recycling. Ministry cooperates with informal sector. Big companies are formally established and have facilities to segregate – in one case they pack circuit board and send to Singapore. In another case they just shred everything, then they process through cyclone to separate plastic from meta, and send the plastic to cement kilns, whilst metals are sent to smelters. As for Informal companies: some of them do only one step. Some of them after taking out some valuable part of the electronic component burn the remaining part. In East Java they add water to segregate, then sometime use a second step with salt. They cannot sell the sinking part to the plastic recycler so that they sell that to the brick manufacturer as fuel.

Based on that, AMC arranged BAT/BEP training. Try-out training in 2 producer companies (copper cable). Master batch for plastic chemicals – they produce the flame-retardant mixture. Training for producer, manufacturers and recyclers. Mojokerto – craft villages of plastic recycling. Dissemination events, videos, short videos like advertisement.

Time:	13/03/2019 Afternoon
Venue: Ministry of Industry	

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Topic of the meeting	Discussion on the ISO 9001 certification of industries.	
<p>Involved in quality assurance for 10 manufacturers. TUV Nord is a German Certification Body. Implementing ISO 9001 to ensure PBDE free products. The 9 companies selected were SMEs. They certified basically the supply chain. The ISO 9001 requires that suppliers provide a certificate of PBDE-free, and that the certificate is issued by an accredited lab. There are no other requirements to certify the absence of PBDE in the raw materials.</p>		

Time:	14/03/2019	
Venue: Bappenas		
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Topic of the meeting	Discussion on the role of BAPPENAS in project implementation	
<p>We appreciated that we have that project. We hope that we can promote reduction and limitation of PBDE. We want the project to be internalized in our system. We expect regulation to be enacted soon. We want to solve the issue of import.</p> <p>Project has initiated many efforts, including drafting regulation which can make initiative for the project to be internalized in our system.</p> <ul style="list-style-type: none"> <li>• Regulation on Controlling and Monitoring of PBDE and UPOPS.</li> <li>• Capacity building on industry and community/sme/recycling business, relevant stakeholders: Training and workshop with Customs and other institutions</li> <li>• Mini depot in Cirebon, as a on how the project's stakeholder can tackle the issue with a reference of how this can be done.</li> </ul>		

Improve general awareness of PBDE and UPOPS, and internalization to the system.

Training and workshop have been conducted for relevant institutions and awareness raising to the general public. The project has developed one mini-depo. This hopefully will showcase the project. This initiative is important for Bappenas.

Challenges:

- Enactment of regulation. Bappenas can help smoothening the project. MOEF is the one who is in charge for the revision PP 74/2001, but MoI also is responsible. Bappenas can help with the directorate law and regulation. Bu Diani can probably lend a hand to assist these difficulties. UNDP needs to advise to MoI that this is the best momentum.
- Infrastructure for B3 also is lacking. Including for PBDE, once we have the regulation, the facilities like laboratories and ones that can process the materials are also lacking.
- Difficulties in identifying DATA PBDE in products, location of where PBDE is located. The project still doesn't have a nationwide identification data. There is a need to identify possible clusters in Indonesia to see where is PBDE mostly located and build mini depots there. Somehow the project assumed that areas with most electronic waste are the areas which can produced PBDE/UPOPS, but having more comprehensive data is important. Work with industrial association to get data, information, SIL (System which inform on the issue).

Sustainability: BAPPENAS is in charge of preparing the next 5 years plan, and will follow the achievement of the SDG 12: promoting sustainable production and consumption, including green industry. Success story of this project will be a good potential for follow up in the next 5 years. Agreement of international commitment already signed. MOI needs to propose to BAPPENAS, and make sure that it is a multi-stakeholders project.

Mini depot should include the funding from the government MoI. With combined funding, MoI will increase the ownership of this project. The model of mini-depo should include funding from the government. We hope we can expand further this pilot demonstration. To access to an increased support, Mojokerto will have to submit a proposal for 2020 within October 2019.

We are additional members of the PSC. We are regularly invited to workshops so that I am satisfied. Gender is one of our concern. If we develop anything, we should also consider the balance. 2 staff from Bappenas were involved. Our directorate is working on loan and finance administration. We want to be sure that financing is running well in accordance with the project schedule.

GEF disburse money to UNDP which use money in accordance to the regulation ministry of finance. We are not involved in the procurement itself

Grants are considered as public funds – These have to be registered under the ministry of Industry access list. It is going to be granted to other institutions. Concerning the equipment delivered by the project, we receive statements of handover certificate.

Do you manage co-financing? The government has funds. The co-financing is coming from Ministry of Industry. We have been invited so many times in the project board meeting. We have been invited to see mini-depo. We were invited to many training events. Our suggestion is to have more effort upstream – in term of policy regulation. It has to be endorsed, it has to be communicated. Plastic import is really a big issue in Indonesia. We see a good partnership between MoF and UNDP. Effectiveness of the use of money. The main problem arises when there is no championing (leadership). However, we consider that the championing of the ministry of Industry is really good. The output of the project is really there – mini-depo, workshop, etc. We usually conduct progress assessment and analysis between actual disbursement and planned disbursement. Based on my assessment the project is currently on track.

Time:	14/03/2019	
Venue: MOF		
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Topic of the meeting	Discussion on the role of AMC in project implementation	
<p>Main function of the directorate: collect foreign donors as sources of financing.</p> <ul style="list-style-type: none"> <li>• Enforcing monitoring for the loans and grants, and oversight.</li> <li>• UNDP report the usage of the fund based on government regulation. For the public and the parliament.</li> <li>• No direct involvement on the assets, including the mini depots.</li> <li>• Grants are considered as public funds. All the funds and assets will be registered under the Mol (executing agency).</li> <li>• Controlled by certification of hand over, and reporting is from project board meetings.</li> <li>• Gol provides funding related to the Stockholm convention. Gol has funding for this, in the Mol. No accounting system for co-financing.</li> <li>• Communication good, information good. Went to see producers of plastic and mini depot, workshops and seminars.</li> <li>• 3 monthly meeting to review the project, based on the disbursement, based on prodoc, output and outcome, based on the timeline.</li> </ul> <p><b>Suggestions;</b> have more effort in the upstream of PBDE: policy regulations, substances related to PBDE, more important in the downstream.</p> <p><b>Sustainability of the project:</b> Gol is focusing of environmental issues, environment has become a major issue in Indonesia. [Not related comment]</p> <p>Main problem in the effectiveness of the project is the organization who is implementing the project. But for this project, Mol has made this project successful, including inviting many stakeholders for every meeting, seminars, and even the output of the project is tangible. [missing the point on the comment on the regulation].</p>		

Time:	Friday 15/03/2019	
Venue: Mojokerto		
Participants	Affiliation	Email
Bambang	Resource Persons: Head of Industry and Trade Office /KADISPENDAG of MOJOKERTO	

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Topic of the meeting	Discussion on the role of AMC in project implementation	

**Issue -1 : Land, Licensing, Capacity and Income**

The district and provincial government have high hopes for the mini depot in Kajangan, Trowulan. The district government has prepared 1ha land for the development of the mini depot, on top of that, the provincial government is ready to hand over 2 ha of land to support the mini depot facilities (to be developed as storage areas, expanded processing areas, etc).

The current population of Kajangan are very active in plastic recycling. 80% of the 6000 inhabitants are involved in the recycling industry (SMEs). The potential capacity for the whole community is circa 114000tons/year. And so far, they are only organizing it home/family based, with some being active members of APDUPI (Association of Plastic Recycler Indonesia—small scale).

The office of trade and industry of Mojokerto supported wholeheartedly the mini depot establishment in the center of the recycling industry, and they are committed to facilitate the community with providing land (in-kind support, should be valued in monetary term), licensing (for hazardous materials handling, storage, etc.), and electricity for the mini depot start up, before it can function independently and sustainably.

Income of the mini depot is focusing on the services of separating, cutting, and crushing. Most small industries do not have the machine for cutting and crushing, hence they do it manually, and resulting in a lesser quality product. The office of trade and industry is hoping, with the establishment of the mini depot, SMEs plastic waste can benefit from the service (with a small ‘retribution’ for the management of the mini depot) and gain profit from a cleaner and representative product.

The basic income from the mini depot is the retribution from the services. It will be circa IDR 1000/kg [0.07 USD] for cleaning and cutting, and IDR 1500/kg [0.11USD] for crushing. The increased income for the finished product will be doubled, for example recyclable water plastic cup is sold for IDR 6000-7000/kg [0.42-0.49USD] (manual process), and can increase to IDR 13000/kg [0.91USD] when it is cleaned properly with machines.

The mini depot will be co-manage between the local community and APDUPI. APDUPI being an organization, they already have networking which can benefit the community in doing business in the plastic waste-recycling sector.

**Issue-2: Plastic waste and PBDE--**

Potential capacity of the mini depot is 14,000ton/year, exclusively for plastic. Compared to the capacity of the Kajagan village in plastic waste management, it is only designed to be able to host and handle 10% of the overall capacity. The project is hoping to spark an interest in the community and industries, so they will replicate and expand similar efforts like the mini depot in the area.

Most plastic are brought to Kajagan from other islands (Kalimantan, Sumatra, Sulawesi) to Surabaya, then the community transported the plastic waste with trucks to Kajagan. No plastic is imported from foreign countries, because of the moratorium of plastic waste import from Gol.

Plastic which cannot be recycled or represents a problem. Some recycler burn it independently, some sell them to nearby brick makers which create more pollution. This is where the mini depot plays its roles: 1. As storage facility; 2.

As a network to the cement kiln (who is envisioned to incinerate the PBDE waste); and 3. As a center for the community to established co-operation and group activities for the plastic waste industry.

Currently in Mojokerto, there is a waste management company which handles hospital waste (PT. Pria) for a fee. For example, hospital waste handled by the company is priced at IDR 15000/kg [1.05USD].

**Closing: Sustainability**

The District government have included mini depot and development of Kajangan Trowulan as the center for plastic waste industry in the Regional Governmental Plan of 2020, including ear-marking IDR 2.5billion [175,316.25 USD] for developing facilities around the mini depot, and preparation of the industry-center in Kajagan.

Time:	Friday 15/03/2019 – full day	
Venue: Mojokerto		
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Topic of the meeting	Discussion on the role of AMC in project implementation	

Visit in the plastic recycling village.

**Background**

In the site several farmers have replaced their original activity with a plastic recycling activity, or integrate the income earned as farmers with the earnings from plastic recycling. Collectors import plastic from other islands. Most of the house fronts are occupied by plastic waste stored and packaged in bags, or already washed, shredded and left drying at the sunlight. The economy of plastic recycling is therefore dominating the village. Some collectors built small factories where plastic is segregated, washed, shredded and dried. The technology and the knowledge to segregate plastic contaminated by PBDE is obviously missing, although different plastic types are also segregate by sink and float in water. The plastic which is not considered sellable is given to local small brick factories where it is burnt. Women are dominating the task of manual segregation of plastic and are paid by amount of plastic they segregate, whilst men are in charge of heavier work and are paid by day. There is no wealth protection for worker whatsoever.

**Meeting with Ibu Nurul**

Ibu Nurul is a single mother of 3, oldest son is in a university in Yogyakarta, second child is in Islamic boarding house nearby, and third son is living with her. She has been divorced since 2016, and **ferociously tough in the industry**. She started her plastic waste recycling business in 2005, from a very small company, until now, an SME.

She owns an SME of plastic cap-bottle (PET, HD, PP) with 25 staff working for her. 10 of the workers are male, whom are daily workers, paid by the day of IDR 85000 to 100000/day [5.96 to 7.02USD] (lunch and drinks included), and 15

females whom are paid by the weight of the products that they separated. For females, it is easier for them to work by the product separated, because they can come to work whenever they pleased, work as much as they can, then do other things. For example, a separator will be paid IDR 1000/kg [0.07USD] for plastic water cup, or IDR 600-1500/kg [0.042-0.11USD] for heavier plastic. Ibu Nurul says that prices are not set, as they depend on the price of oil. The more oil prices goes up, the more expensive plastic waste will be valued.

Ibu Nurul anticipating the benefit for the mini depot for the Kajagan community are:

1. As storage for PBDE plastic waste (currently she and her neighbors are sending the PBDE plastic (or bromide) to nearby brick makers, which burn the plastic waste and created air pollution. With mini depot, hopefully the waste can be managed.
2. for small companies who do not have crusher machines, mini depots can give crushing services.
3. Kajagan village can have a clean and better environment, currently most plastic recyclers are using their house as storage.
4. waste product and waste water are not directly dumped to the river.

Consideration on what we have seen: although Ibu Nurul is the community champion on plastic recycling, it seems that here awareness on the issues related to the possible contamination of plastic and the needed protection measures are scarce. None of the workers adopt any form of PPE, and all of them work in very uncomfortable conditions, no matter if they are exposed to chemicals in plastic or not.

#### Hard plastic

Raw waste bought from other island (Kalimantan, Sumatera, etc) at IDR 1700/kg [0.12USD], processed and crushed.

Identification is done with petroleum and touch (with finger, e.g. sticky/not sticky)

White plastic is more expensive once processed and crushed at IDR 10000/kg [0.70USD].

#### Meeting with Head of Village (Lurah)

Plastic recycling industry started since 1970 in Kejagan village, but at that time, most people are still doing agriculture. But starting in 1990-2000, the plastic recycling industry was booming, and now 80% of the 7000 villagers (adults) are involved in the plastic recycling industry.

When asked about the health of his community, the village leader was very vague. He claimed there is no data on health changes of the community, before and after the industry started. He added when someone gotten sick, or died, most probably because of natural reasons, and already met his/her time.

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Harti Ningish	UNDP Jakarta	<a href="mailto:harti.ningsih@undp.org">harti.ningsih@undp.org</a>
Topic of the meeting	Discussion on the role of the national research center in project implementation	
<p>National research center in charge of testing materials and products. The center is the biggest Indonesian center with around 180 staff. They test electric and electronic products in compliance with the IEC testing standards. They also test equipment for ROHS compliance. They use XRF, atomic adsorption and GC/MS for some organics including (reportedly) PBDEs. Their involvement on the certification of plastic is however limited. Currently, certification of plastic based on the SNI is voluntary. Given the material flow between informal recyclers and industries, there is no way to verify whether a certain plastic article is made of recycled or virgin plastic.</p>		

Time:	Saturday 16/03/2019 – full day	
Venue:	Minidepo in Cirebon	
Participants		Email
	Meetings with several project partners	
Linda Yanti Sulistiawati	MTR consultant-national	<a href="mailto:lindayanti@ugm.ac.id">lindayanti@ugm.ac.id</a>
Carlo Lupi	MTR consultant-international	<a href="mailto:carlolupi@popchemicals.org">carlolupi@popchemicals.org</a>
Kurnia Hanafiah	UNDP Jakarta	<a href="mailto:kurnia.hanafiah@undp.org">kurnia.hanafiah@undp.org</a>
Harti Ningish	UNDP Jakarta	<a href="mailto:harti.ningsih@undp.org">harti.ningsih@undp.org</a>
Topic of the meeting	Discussion on the role of the national research center in project implementation	

#### **Meeting with Lohjinawi NGO.**

Since 2012 they work with UNILEVER for managing waste from plastic. They were involved with UNDP 3 yrs ago.

In the village they dump waste and burn. With the mini-depo they hope they can manage better the waste.

The NGO started with village socialization on waste and waste bank, aiming to reach to all people in the Babakan village: residents (4000 people), Muslim school (9000 people). So far, the people of Babakan is receptive to the program, and the NGO introduced waste bank organization to the community. People here are mostly farmers

6 blocks of residents and Islamic schools. For every block they established a waste bank.

They are trained to segregate the waste from the source on informed on the value of the waste. They have a routine day for collection of waste.

The possible capacity is 2kg per household per day \*70\*6

Schools 2 to 3 kg per room per day they have 45 schools – around 9000 students. The benefit for the mini depo 2000 rupia/kg for the bottle; after cleaning and if the amount is big, the factory will pay up to 6000 rupia/kg. After crushing they can go up 13000 / kg. The waste bank will give the money once a year. For the community they ask the money are given before the Muslim celebration day.

Each unit for each block will organize their own. The village heads will be in charge of running the mini-depo.

Training on business management has not been yet delivered, it should be delivered however.

In case of plastic to be disposed there is a cement kiln however the discussion with them did not start yet.

They collected several waste that may contain PBDE.

#### **Meeting with Bogor, Environmental Practitioner**

He claimed being capable to bioremediating plastic, using Pseudomonas SP and Spingomonas SP, metal eater bacteria. They came from plastic, exist in landfill area for more than 20 years. Bacteria are isolated and will be able to eat plastic together with pumpkin. However, this is at experimental stage and not demonstrated yet. The research needs quite a substantial amount of funds.

He also proposed to manufacture a kind of “artificial marble” made of plastic residue and resin. Training for the community making the ceramic composite. For example, for 2x1 table, production cost is IDR 250000, and can be sold

to IDR 1000000. However, he proposed the use of epoxy resin as filler for artificial marble which is toxic. Research is needed also on this solution.

**Meeting with the head of the Muslim school, Ustad Asep, Pesantren NURUL HUDA**

There are 42 school complex – Muslim boarding school. (around 9000 people) – teaching Arabic, English, Japanese. 2 reasons one to spread religion other to offer education and formation.

The union tried several things to solve their problem of waste (some of them very bad like piling waste on the river bank, which was subsequently observed during the site visit). Finally, one alumni contacted UNDP and this was why the area was involved in the project. The plastic will be processed in the mini-depo. However, they have the following type of waste: 1. wet / organic; 2. Diapers; 3. plastic waste; 4. electronic/industrial waste

They started the discussion with the cement kiln. The cement factory will process plastic and electronic waste – still at talking level. The name of the cement kiln is Tiga Roda cement, 20 minutes from Babakan.

**6.6. SIGNED UNEG CODE OF CONDUCT FORM**

**Evaluators/Consultants:**

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study limitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

**MTR Consultant Agreement Form**

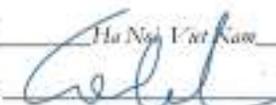
Agreement to abide by the Code of Conduct for Evaluation in the UN System:

Name of Consultant: Carlo Lupo \_\_\_\_\_

Name of Consultancy Organization (where relevant): \_\_\_\_\_

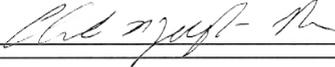
**I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.**

Signed at Ha Noi, Viet Nam (Place) on 07/06/2019 (Date)

Signature:  \_\_\_\_\_

6.7. SIGNED MTR FINAL REPORT CLEARANCE FORM

*(to be completed by the Commissioning Unit and UNDP-GEF RTA and included in the final document)*

<b>Midterm Review Report Reviewed and Cleared By:</b>	
<b>Commissioning Unit</b>	
Name: <u>Anton SRI PROBISANTONO</u>	
Signature: <u></u>	Date: <u>17 Dec. 2019</u>
<b>UNDP-GEF Regional Technical Advisor</b>	
Name: <u>Christine Wellington-Moore</u>	
Signature: <u></u>	Date: <u>17-Dec-2019</u>

## 7. REFERENCES

1. **Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.**
2. ***Stockholm Convention on Persistent Organic Chemicals (POPs) as amended in 2009.***
3. **GEF. *GEF 5 Focal Area Strategies - Chemical Strategy.* 2011.**
4. **UNEP. *Basel Convention Updated general technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants (POPs).* *chm.pops.int.* [Online] 2011.  
[http://chm.pops.int/Portals/0/flash/popswastetrainingtool/eng/All\\_technical\\_guidelines\\_on\\_POPs\\_4.pdf#page=2](http://chm.pops.int/Portals/0/flash/popswastetrainingtool/eng/All_technical_guidelines_on_POPs_4.pdf#page=2).**
5. **UNDP. *Guidance for conducting Mid Term Reviews of UNDP supported, GEF financed projects.* 2014.**
6. **—. *UNDP-GEF Midterm Review - Term of Reference for International consultant.* 2018.**

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