



**“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”**

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**Region: Asia and the Pacific**

**Focal Area: Chemical (GEF-5)**

**Project Timeframe: March 2016-March 2021**



**Draft Report of the Terminal Evaluation  
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### Disclaimer

*Please note that this report's analysis and recommendations do not necessarily reflect the United Nations Development Programme's views, its Executive Board, or the United Nations Member States. This publication reflects the views of its author.*

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## LIST OF ACRONYMS

<b>3R</b>	Reduce, Reuse and Recycle
<b>4R</b>	Reduce, Reuse, Recycle and Recovery
<b>ACFTA</b>	ASEAN – China Free Trade Agreement
<b>ADIPURA</b>	An Award for a City in Indonesia able to perform in its cleanliness and environmental management. The programme was started as of 1986.
<b>AEC</b>	ASEAN Economic Community
<b>AMDAL</b>	<i>Analisa mengenai Dampak Lingkungan</i> (Environmental Impact Assessment)
<b>APHINDO</b>	<i>Asosiasi Industri Plastik Hilir Indonesia</i> (Association of Plastic Converting Industry in Indonesia)
<b>ASEAN</b>	Association of Southeast Asian Nations
<b>B3</b>	<i>Bahan Berbahaya dan Beracun</i> (Toxic and Hazardous Substances)
<b>Bappedal</b>	<i>Badan Pengendalian Dampak Lingkungan</i> (Environmental Impact Control Agency)
<b>BAT/BEP</b>	Best Available Techniques/Best Environment Practices
<b>BFRs</b>	Brominated Flame Retardants
<b>BPOM</b>	<i>Badan Pengawas Obat dan Makanan</i> (National Agency of Drugs and Foods Control)
<b>BSN</b>	<i>Badan Standard Nasional</i> (National Standard Agency)
<b>CoC</b>	Certificate of Conformity
<b>CRT</b>	Cathode Ray Tube
<b>CSR</b>	Corporate Social Responsibility
<b>DKI</b>	<i>Daerah Khusus Ibukota</i> (Capital Special Region)
<b>EIA</b>	Environmental Impact Assessment
<b>ELV</b>	End of Life Vehicles
<b>EPR</b>	Extended Producer Responsibility
<b>Etc.</b>	Et cetera
<b>EU</b>	European Union
<b>FDS</b>	Final Disposal Sites
<b>FTA</b>	Free Trade Agreement
<b>GEF</b>	Global Environment Facility
<b>GEF STAP</b>	GEF Scientific and Technical Advisory Panel
<b>GIATPI</b>	<i>Gabungan Industri Aneka Tenun Plastik Indonesia</i> (Indonesia Woven Polyolefin Manufacturers Association)
<b>GOI</b>	Government of Indonesia
<b>GR</b>	Government Regulation
<b>HCB</b>	Hexachlorobenzene
<b>HZW</b>	Hazardous Waste
<b>ICT</b>	Information and Communication Technology
<b>INApIas</b>	<i>Asosiasi Industri, Olefin, Aromatik dan Plastik Indonesia</i> (Indonesian Olefin, Aromatic and Plastic Association)
<b>Jabodetabek</b>	Jakarta, Bogor, Depok, Tangerang and Bekasi (Jakarta and its vicinity area)
<b>Kepmen</b>	<i>Keputusan Menteri</i> (The Decree of Minister)
<b>Keputusan</b>	Decree
<b>KLHS</b>	<i>Kajian Lingkungan Hidup Strategis</i> (Strategic Environmental Assessment)
<b>LB3</b>	<i>Limbah Bahan Berbahaya dan Beracun</i> (Toxic and Hazardous Wastes)

<b>LCD</b>	Liquid Crystal Display
<b>LDPE</b>	Low-Density Polyethylene
<b>LoS</b>	Level of Service
<b>MET</b>	Metric Ton or MT or Mton
<b>MOEF</b>	Ministry of Environment and Forestry
<b>MOF</b>	Ministry of Finance
<b>MOH</b>	Ministry of Health
<b>MOI</b>	Ministry of Industry
<b>MP3EI</b>	<i>Master Plan Percepatan Pembangunan Ekonomi Indonesia</i> (Master Plan for Acceleration and Expansion of Indonesia's Economic Development)
<b>MSW</b>	Municipal Solid Waste
<b>MSWM</b>	Municipal Solid Waste Management
<b>My Darling</b>	<i>Masyarakat Sadar Lingkungan</i> (Communities who are aware of their environment)
<b>NGO</b>	Non-Government Organization
<b>NIP</b>	National Implementation Plan (it refers to National Implementation Plan on Elimination and Reduction of Persistent Organic Pollutants in Indonesia)
<b>Nr.</b>	Number
<b>Packindo</b>	Indonesian Packaging Federation
<b>PBDEs</b>	Polybrominated Diphenyl Ethers
<b>PCBs</b>	Polychlorinated Biphenyl
<b>PCDD/Fs</b>	Dioxins and Furans
<b>PET</b>	Polyethylene Terephthalate
<b>POPs</b>	Persistent Organic Pollutants
<b>PP</b>	Polypropylene
<b>PRO</b>	Producer Responsibility Organization
<b>PUR</b>	Polyurethane
<b>PVC</b>	Polyvinylchloride
<b>RCU</b>	Regional Coordinating Unit
<b>REACH</b>	Registration, Evaluation, Authorization and Restriction of Chemicals
<b>RoHS</b>	Restriction on the use of certain Hazardous Substances
<b>RT/RWP</b>	<i>Rencana Tata Ruang dan Wilayah Propinsi</i> (Provincial Spatial Plan)
<b>SAICM-QSP TF</b>	Strategic Approach to International Chemicals Management - Quick Start Programme Trust Fund
<b>SGS</b>	SGS S.A. (formerly <i>Société Générale de Surveillance</i> ) is a multinational company headquartered in Geneva, Switzerland, which provides inspection, verification, testing and certification services
<b>SWM</b>	Solid Waste Management
<b>TDS</b>	Temporary Disposal Sites
<b>TOR</b>	Terms of Reference
<b>TV</b>	Television
<b>UNDP</b>	United Nations Development Programme
<b>UNEP</b>	United Nations Environment Programme
<b>UNIDO</b>	United Nations Industrial Development Organization
<b>UPOPs</b>	Unintentionally produced Persistent Organic Pollutants
<b>US</b>	United States (of America)
<b>USA</b>	United States of America
<b>USD</b>	United States of America Dollar
<b>USEPA</b>	United States Environmental Protection Agency
<b>WEEE</b>	Waste Electrical and Electronic Equipment
<b>WHO</b>	World Health Organization

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## Project summary table

**Table 1: Project Information Table**

Project Details		Project Milestones	
Project Title:	Reducing Releases of Polybromodiphenyl Ethers (PBDEs) and Unintentional Persistent Organic Pollutants (UPOPs) Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia	PIF Approval Date	12 April 2013
UNDP Project ID (PIMS #)	5073	CEO Endorsement Date (FSP) / Approval date (MSP):	11 December 2014
GEF Project ID:	5052	ProDoc Signature Date:	16 March 2016
UNDP Atlas Business Unit, Award ID, Project ID	00091789	Date Project Manager hired:	
Country/ Countries:	Indonesia	Inception Workshop Date:	29 March 2016
Region:	Asia Pacific	Mid-Term Review Completion Date:	29 May 2019
Focal Area:	Chemicals and waste	Terminal Evaluation Completion date:	07 April 2021
GEF Operational Programme or Strategic Priorities/Objectives	GEF-5 Chemicals Strategy: <ul style="list-style-type: none"> <li>• Objective 1: Phase out POPs and Reduce POPs Releases.</li> <li>• Production and use of controlled POPs chemicals phased out. (GEF-5 Outcome 1.1)</li> <li>• POPs releases to the environment reduced. (GEF-5 Outcome 1.3)</li> <li>• Country capacity built to effectively phase out and reduce releases of POPs (GEF-5 Outcome 1.5)</li> </ul>	Planned Operational Closure Date:	16 March 2020
Trust Fund	GEF TF		
Implementing Partner:	Ministry of Industry		
NGOs / CBOs Involvement	Konsorsium Lingkungan Hidup		
Private Sector Involvement	Perum Jasa Tirta APHINDO		
Geospatial Coordinates of Project Sites:	-		
Financial Information			
PDF/PPG	at approval (US\$M)		at PDF/PPG completion (US\$M)
GEF PDF/PPG grants for project preparation	0.100		0.100
Co-financing for project preparation			
Project	at CEO Endorsement (US\$M)		at TE (US\$M)
[1] UNDP contribution:	0.347		0.400
[2] Government:	10.765		5.000
[3] NGO	3.046		0.166
[4] Private Sector:	1.800		13.525
[5] Local Government			0.141
[6] Total co-financing [1+2+3+4+5]:	15.960		19.232
[7] Total GEF funding:	3.990		3.990
[8] Total Project Funding [6 + 7]	19.950		23.222

## EXECUTIVE SUMMARY

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' was implemented in Indonesia. The project's objective was to assist the country in implementing its relevant obligations under the Stockholm Conventions, and to reduce release of PBDE and UPOPs. The project objective included strengthening the sound management of chemicals and waste to protect human health and the environment.

The project's objectives were to be achieved by supporting the plastic industry in Indonesia to ensure that no banned PBDEs were to be used or recycled into new manufacturing articles. In addition, the municipal and community waste management's environmentally sound and safe operations was to be supported to reduce harmful releases of PBDEs and UPOPs. The targeted outcome of the project was 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.

Table 2 provides the summary of the planned outcomes. It also shows the achievements for different planned Outcomes of the project, in terms of the indicators in the results framework of the project.

**Table 2: Summary of Attainment of Results / Outcomes of the project**

Component/Output	Activity Results/ Output	Achievement Rating
<b>Component/ Output 1: Strengthening the National Policy and Regulatory Framework</b>	Activity Result/ Output 1.1: Strengthening the national policy and regulatory framework to reduce UPOPs and PBDE releases from plastics manufacturing, recycling, and disposal practices	The results for Component 1/Output 1.1 is unlikely to contribute significantly towards to impacts and the achievement of the project objectives. However, based on the performance of the indicators, the achievement of results for Component 1/Output 1.1 is <b>rated as Moderately Satisfactory.</b>
<b>Component/ Output 2: Reducing or Eliminating the Importation and Use of PBDEs in Plastics Manufacturing</b>	Activity Result/ Output 2.1: Sufficient national technical expertise built to meet challenges with PBDEs in manufacturing and plastic raw material recycling.	The activities under this component of the project, required identification of PBDE containing plastic waste. The challenge faced was how the recyclers/plastic goods manufacturers identify the PBDE containing plastic waste/recycled plastic. The issue is the availability of an affordable and practical method to identify PBDE containing materials at the level of plastic waste handlers/manufacturers of plastic goods.  Although, the project has supported some of the instruments for identifying PBDE containing plastic waste, there numbers are very limited and given the cost, the
	Activity Result/ 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.	

Component/Output	Activity Results/ Output	Achievement Rating
		possibility of the plastic waste collectors buying them is remote.  The achievement of results for Component 2/Output 2 of the project is <b>rated as Moderately Satisfactory</b> .
<b>Component/ Output 3: Reducing UPOPs and PBDEs from Unsound Plastics Recycling</b>	Activity Result/ 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.	As for Outcome 2, the issues in this case as well as that techniques to identify PBDE-containing plastics at the level of recyclers could not be introduced largely due to the absence of practical and cost-effective methods to identify PDBE containing plastics.
	Activity Results/ 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 practices at recycling entities.	The project tried to introduce some rudimentary methods to identify PBDE containing plastic scrap, but these methods are not established one and didn't work well.  The achievement of results for Component 3/Output 3 is <b>rated as Moderately Satisfactory</b>
<b>Component/ Output 4: Reducing releases of UPOPs and PBDEs from unsound plastic disposal practices</b>	Activity Results/ Output 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	The project has successfully supported establishment of six mini depots for collection and preliminary processing of plastic waste. The operations in the mini depots started towards the end of the project. Thus, the quantum of waste being processed is falling short of the target. However, going forward the targeted level of operation of the mini depots is likely to be achieved The achievement of results for Component 4/Output 4 of the project is <b>rated as Satisfactory</b> .

**Table 3** provides the ratings for relevance, effectiveness, efficiency, sustainability, and impacts of the project. The Table also provides the ratings for Monitoring and Evaluation (M&E), Implementing Agency (IA) and Implementing Partner (IP) Execution, and Assessment of Outcomes.

**Table 3: Terminal Evaluation Ratings<sup>1</sup>**

1. Monitoring & Evaluation (M&E)	Rating
M&E design at entry	S
M&E Plan Implementation	S
Overall Quality of M&E	S
2. Implementing Agency (IA) Implementation & Implementing Partner (IP) Execution	Rating
Quality of UNDP Implementation/Oversight	S
Quality of Implementing Partner Execution	S
Overall quality of Implementation/Execution	S

<sup>1</sup> Ratings for Relevance; Relevant (R), Not relevant (NR)

Ratings for Outcomes, Effectiveness, Efficiency: Highly Satisfactory (HS): no shortcomings; Satisfactory (S): minor shortcomings; Moderately Satisfactory (MS), moderate shortcomings; Moderately Unsatisfactory (MU), significant shortcomings; Unsatisfactory (U), major problems; Highly Unsatisfactory (HU), severe problems

Ratings for Sustainability: Likely (L), negligible risks to sustainability; Moderately Likely (ML), moderate risks; Moderately Unlikely (MU), significant risks; Unlikely (U): severe risks

<b>3. Assessment of Outcomes</b>	<b>Rating</b>
Relevance	R
Effectiveness	MS
Efficiency	MS
Overall Project Outcome Rating	MS
<b>4. Sustainability</b>	<b>Rating</b>
Financial sustainability	ML
Socio-political sustainability	L
Institutional framework and governance sustainability	ML
Environmental sustainability	L
Overall Likelihood of Sustainability	ML

**The achievement of project objectives is rated as Moderately Satisfactory.**

Some of the barriers identified at the PPG stage, by the project towards addressing the release of UPOPs and PBDE in Indonesia include absence of regulations; Lack of institutional capacity; Lack of Professional and Technical limitations; lack of expertise and experience in dealing with chemicals and POPs management; lack of technical capacity (such as national laboratories). The project successfully led to reduction in the release of UPOPs by addressing some of these barriers.

The efforts towards reduction in the release of PBDE were not complete were not that successful. The practice which did not work in the case of the project was the regulations towards limiting the use of PBDE in the products. This was not a very cost-effective solution, as PBDE is not produced in any part of the world since 2004, thus, the possibility of its use in the products was restricted to the use of old recycled plastic, which possibly may contain PBDE. Although, the project successfully created some of the regulations, the impacts were not significant. For avoidance of the release of PBDE the approach required to be followed should have been aligned to destruction of existing inventory. Destruction of existing inventory is the approach which is typically followed for the POPs (e.g., PCB, DDT etc.)

One of the best practices out of the project was the use of the concept of mini depots for management of plastic waste. This worked well for addressing the emissions of UPOPs, in one of the major sources of such emissions and releases, i.e., disposal of non-recyclable plastic waste. This was achieved by facilitating the collection and aggregation and value addition at mini depots. The plastic waste that is recyclable and has economic value is collected and recycled at its own, if the volumes of waste at a given location are sufficient to justify commercial operations. The non-recyclable plastic waste, which comprises of Multi-layered packaging, thin blown films, small pieces of plastic, don't get collected and is littered. These non-recyclable plastics at times get used as fuel or are burnt as a disposal method. Open burning of non-recyclable plastics is one of the primary sources of dioxins emissions to the atmosphere.

One of the objectives of the project was to demonstrate and promote best practices and techniques for non-recyclable plastic waste which at the same time can reduce the emission of UPOPs and reduce risks to the workers in the plastic waste collection and recycling facilities. The project has partially achieved this objective. The shortcomings were there as an arrangement to dispose of non-recyclable plastic waste in a safe manner (e.g., by co-incineration in a cement kiln) could not be made in a timely manner.

The other objective of the project was to address the emissions/release of PBDE due to recycling and/or disposal or PBDE containing plastic waste. Once again, this was to be achieved by promotion and demonstration of best practices for PBDE containing plastic waste. The PBDE part of the project had limitations due to absence of cost-effective and practical methods for the identification of PBDE containing plastic waste. However, the project successfully overcame this issue by providing Br. Detecting equipment to the recyclers.

To achieve cooperation from the national counterparts in Indonesia, the global environmental objectives of the project were linked with the effectiveness of the waste management in the country. The rationale

of the project was that best practices for waste management leads to improvement in the local environment.

Training and capacity building was one of the major efforts of the project. Training and capacity building were carried out across various stakeholders, ranging from the government officials, waste pickers, recycling industry, trade association, and NGOs

Some of the lessons learned that can be applied to future UNDP-supported GEF-financed interventions in the focal area of 'Management of Chemicals and Waste' are as follows;

- a) For the project design, it would help if the indicators like reduction in the emission of POPs have a target value to be achieved, during the implementation of the project and post project implementation.
- b) The project design and implementation missed out on one of the important stakeholders, that is the cement kilns (or other places for safe disposal of plastic waste), where PBDE containing plastic waste and non-recyclable plastic waste can be disposed on in a manner which doesn't lead to emission of PBDE and UPOPs. It is recommended that for the projects directed towards the destruction of POPs, it would help to take on board the stakeholders which would eventually take up the task of safe disposal.
- c) The project design has not provided any incentive (or making good the potential loss) for the plastic waste collector to take/handover any PBDE containing plastic waste for disposal at a designated place for safe disposal of PBDE containing plastic waste. Considering that any plastic waste collected by a waste picker/recycler, is a mean of livelihood for them and their preference would be to sell it to the recycling industry to recover the cost of collection and some earnings. It is recommended that any project designed for the elimination of POPs/POPs containing material, provision is for the cost of collection and safe disposal of the material.
- d) Management of the waste in a given urban area is the responsibility of the Urban Local Body (ULB). To ensure effective implementation of management of waste-related projects, the local governing bodies (ULB/municipal corporation/provincial government/ other local governing bodies) may be included in the administrative set up for implementation of the project. The representative of such local bodies, where the pilot projects/actions are planned may be included in the 'Project Board' as members.
- e) The process of formation of UPOPs and POPs (other than UPOPs) are different. Although, the emissions pathways to the environment may at times be common (e.g., management of waste). The techniques required to address the emissions of UPOPs, and POPs are different. For example, in the case of UPOPs the emphasis is on avoidance of formation, whereas, in the case of POPs the emphasis needs to be on destruction. It is recommended that for the projects that aim to reduce the emission of both POPs and UPOPs, the set of components/outcomes of the project should be separate for POPs and UPOPs.

**Table 4: Recommendations Table**

Rec #	TE Recommendation	Entity Responsible	Time frame
<b>A</b>	<b>Category 1: Actions to follow up or reinforce initial benefits from the project</b>		
A.1	Creation and successful operation of the mini depot has been one of the achievements of the project. During the project, the mini depots were supported by the project. To ensure the sustainability of the operations and to facilitate replication, it would help if a proper administrative and business model for the operation and management of the mini depot is prepared and implemented. Proper representation of women in the management structure needs to be ensured. Also, a detailed case study of the concept of mini depot, its financial viability, followed by wider	UNDP CO National Government	At the earliest or undertaken this as a part of any other ongoing project for managing waste

Rec #	TE Recommendation	Entity Responsible	Time frame
	dissemination of the case study, would attract investment for the establishment of the more mini depot.		
<b>B</b>	<b>Category 2: Proposals for future directions underlining main objectives</b>		
B.1	Based on the success of the project to demonstrate management of plastic waste and reduction of the emissions of UPOPs using the concept of segregation of different types of plastic waste by the waste pickers and preliminary processing at the mini depot level, a follow up project may be taken up to replicate the concept of mini depots (implemented by private sector). Donor funds can be utilized for information dissemination, study tour to the successful mini depots, development of the business model, organizing the workshops for the entrepreneurs to take up establish the mini depots.	UNDP CO National Government	At the earliest or undertaken this as a part of any other ongoing project for managing waste
B.2	To increase participation and sustainable community support, it would be beneficial if a component of the younger generation was involved. An example of a best practice can be seen at the Mini Depot in Cirebon, where Karang Taruna was actively engaged and succeeded in garnering full support from the community. The involvement of youth organizational units such as youth organizations and the Scout Movement certainly has great potential to increase support from the wider community.	UNDP CO National Government	At the earliest or undertaken this as a part of any other ongoing project for managing waste
<b>C</b>	<b>Category 3: Best and worst practices in addressing issues relating to relevance and performance</b>		
C.1	To ensure the effectiveness/impacts of the projects relating to elimination/emission reductions of POPs (other than UPOPs), it would help to have a detailed assessment of the baseline line situation regarding the presence of the targeted POPs in the country where the project is going to be implemented. It would also help, if such a baseline assessment considers the status of the targeted POP in the Stockholm Convention and the status of production/use of the POP internationally. It would be useful to include this information in the Project Document, as it would help and provide some guidance to the team implementing the project.	UNDP CO National Government	This may be clubbed with the ongoing work for updating of NIP for SC
C.2	Most of the Mini-Depots created under the project are running successfully. However, in case of one of the depots supported by the project for plastic waste management, the operations of the mini depot and the MSW are carried out by the same organization wherein the administrative set up and the financials are not segregated. Although, the operation of mini depots for plastic waste is financially viable on its own, difficulties are being faced in its operations, as the earnings from the sale of plastic get utilized for the operation of the MSW part of the operations. It is recommended that to ensure sustainability, the operations of mini depots for plastic waste should be kept administratively and financially separate from the MSW management.	UNDP CO National Government	At the earliest, delink the working of Mini-Depot and the management of MSW

## 1. INTRODUCTION

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### 1.1 Context, purpose of the terminal evaluation, and objectives

With the project ‘Reducing Releases of Polybromodiphenyl Ethers (PBDEs) and Unintentional Persistent Organic Pollutants (UPOPs) Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia’ reaching the end of its implementation, a ‘Terminal Evaluation (TE)’ of the project has been carried out. This is as per the standard practice for all UNDP-supported GEF-financed projects. The target audience for the Terminal Evaluation were the funding agencies, project partners and beneficiaries, UNDP CO, UNDP at regional and HQ levels and UNDP Evaluation Office.

The project aims to assist the country in implementing its obligations under the Stockholm Convention to reduce the releases of PBDEs and UPOPs, as well as strengthening the sound management of chemicals and waste in order to protect human health and the environment, which will result in social and economic benefits to vulnerable people such as the reduced burden of diseases and reduced health care and environmental remediation costs. This will have an overall positive impact on the society and best felt by more vulnerable groups.

The UNDP Indonesia CO engaged a team of two independent consultants comprising an International Consultant (Dinesh Aggarwal, India) and a National Consultant (Ari Wijanarko Adipratomo, Indonesia) to carry out the TE of the project as per the scope and terms of reference presented in **Annex A**. The broader defined objectives of the TE were as follows:

- To compare planned Outcomes of the project to actual Outcomes
- Identify (if applicable) the causes and issues which contributed to non-achievement of the targets of the project.
- Draw lessons that can both improve the sustainability of benefits from the project and aid in the overall enhancement of UNDP programming.

### 1.2 Scope and methodology of terminal evaluation

The evaluation has been carried out in accordance with the Guidance for Conducting TEs of UNDP-supported GEF-financed Projects, as provided in the ‘Handbook on Planning, Monitoring and Evaluating for Development Results’. Prior to the start of the TE, an inception report was prepared and shared with the UNDP CO in Indonesia and the project team. The inception report outlined the approach and methodology to be followed while carrying out the evaluation. It also provided the timelines for the evaluation. The inception report included a table providing the criteria for the evaluation and the list of main evaluation questions. The evaluation criteria and the main evaluation questions largely draw from the TOR for the evaluation, which, in turn, is based on the Guidance for TEs. Included in the main evaluation questions are some of UNDP CO and the project team's suggestions at the inception stage of the TE. The table of TE criteria and the questions is given in **Annex B**. Accordingly, the methodology for carrying out the TE was comprised of the following activities:

- **Review of Documents:** Review of ‘Project Design Document’ and all relevant information sources, including documents prepared during the preparation phase. The review of documents included a review of financial data, mid-term evaluation report, samples of project communication material etc. **Annex C** provides the list of documents reviewed.

- **Mission to Indonesia<sup>2</sup>, interviews with stakeholders and site visits.** Stakeholder consultations were carried out from 22<sup>nd</sup> December 2020 to 12<sup>th</sup> January 2021. The consultations included a briefing by the UNDP PMU and the project team. The process of stakeholder consultations was concluded with a presentation regarding the initial findings. Interviews with different stakeholders and project participants were carried out. The stakeholders included the sites where the project has supported the plastic waste management facilities. **Annex D** provides the overall schedule of the stakeholders' consultations. The stakeholder consultations served the purpose of collecting some additional documents to support evidence-based evaluation. Some of the documents were sought and received during and after the stakeholder's consultations.

The project performance assessment has been carried out based on the expectations set out in the Results Framework of the project (as provided in the Project Document), which provides performance and impact indicators for project implementation. While doing so, the set of indicators, as mentioned in the project's result framework, along with the corresponding sources for verification, were considered. While carrying out the evaluation, emphasis has been placed on evidence-based information that is credible, reliable, and useful. As stipulated before, some additional documents supporting the achievements of the project were collected during stakeholder's consultations.

The review of documents provided the basic information regarding the activities carried out to attain the desired outcomes and the actual achievements. However, the stakeholder consultation was needed to verify the information, get some missing data, and learn about the stakeholders' opinion and project participants to interpret the information. The interviews with the key stakeholders' / project participants were based on open discussion to allow respondents to express what they considered were the main issues. This was followed by more specific questions on the issues mentioned. During the interviews, the evaluation criteria, and the questions (Please see **Annex B**) were used as the check list to raise relevant questions and issues.

### 1.3 Limitations

The 'Terminal Evaluation' had the limitation of the available time and hence the scope of the stakeholder's consultation process. One of the other limitations was that a physical mission to meet the stakeholders in person and to visit the pilot project sites for verification could not be undertaken, due to the travel restrictions in view of the COVID 19 pandemic. However, the evaluators are of the view that the intensive desk review of documents followed by the stakeholder consultation provided the required level of information to make a reasonable assessment of the achievements of the project. One of the other limitations (particularly for the International Consultant) was that some of the documents (particularly the deliverables out of consultancies supported by the project) were in 'Indonesia Bhasha' language. The PMU made available the English language versions of the documents to the extent they could be organized. The national consultant also helped to understand the contents of the documents, which were in Bahasa Indonesia (Indonesian Language). The rest of the documents were translated using 'Google online Translations', which, though not very accurate, provides enough details to understand the contents of the document.

### 1.4 Ethical Standards

The evaluation has been conducted in accordance with the principles outlined in the United Nations Evaluation Group 'Ethical Guidelines for Evaluation' as given in **Annex E**.

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<sup>2</sup> Due to travel restriction due to COVID 19, no physical mission was undertaken and the consultations with the stakeholders were carried out remotely using online meeting platforms and phone

## 1.5 Structure of the Terminal Evaluation report

The structure of the report is as per the format suggested in terms of Reference for the TE. However, the contents of the chapter on findings have been split into three separate chapters due to the size of the text and for the sake of ease of readability of the report.

The report starts with a chapter providing an introduction which is followed by the chapters of project description and findings. The last chapter of the report provides the conclusions and recommendations. Additional information is provided in the Annexes to the report. The 'Executive Summary' of the report is provided in the beginning of the report and the rest of the report is organized as follows:

- Chapter 1: Introduction to the project
- Chapter 2: Project description and development context
- Chapter 3: Findings: Project design and formulation
- Chapter 4: Findings: Project implementation
- Chapter 5: Findings: Project results
- Chapter 6: Conclusions, recommendations, and lessons

As has been mentioned before, the findings have been organized in three chapters (instead of one single chapter as suggested in the TOR) due to the size of the text. **Annex B** shows where the main criteria and questions of the TE can be located in different sections of the report.

## 2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

### 2.1 Project start and duration

The project was originally planned to start in October 2015. However, the Project Document was signed in March 2016 for a duration of four years. The project originally was scheduled to end in March 2020. The project was granted a no-cost extension of one year. Accordingly, the planned closing date for the project is March 2021. The Mid-term Evaluation was conducted in March 2019. The key timelines which are planned or expected for project implementation are shown in Table 5 below.

**Table 5: Key project's Milestone**

Milestone	Date
PIF Approval Date	12 April 2013
Project Approval Date	11 December 2014
Original Commencement Date (signature of Project Document)	16 March 2015
Original Closing Date	16 March 2020
Revised Closing Date	31 March 2021
Mid Term Review Date	March 2019
Terminal Project Evaluation	December 2020-April 2021

### 2.2 Problems that the projects sought to address<sup>3</sup>

In Indonesia, the generation of plastic waste is growing very fast and subsequently becoming an increasing concern. It is estimated that in Indonesia, 38.5 million tons of solid waste is generated annually. The municipal solid waste is composed of 62 percent of mainly organic waste, 14 percent plastics, 9 percent paper, 2 percent glass, 2 percent rubber and leather, 2 percent metals, and 13 percent of other waste types. The amount of plastic in the waste flow at an aggregate level in the country is about 5.39 million tons per annum.

Recycled plastics producers are stepping in to meet the challenge of managing the plastic waste on the one hand, while on the other hand meeting the growing demand for plastic products. The practice of plastic recycling in the country is still in its infancy due to a lack of supporting infrastructure, leaving the sector mainly in the informal sector's hands, generally low-income population including women and children, and therefore lacking economies of scale. Further, not all plastic waste is recyclable. The non-recyclable plastic waste gets littered or dumped along with the MSW. Some of the non-recyclable plastic also gets used as fuel by the households and cottage industry. Part of the plastic waste, which gets dumped at times, gets burned. The uncontrolled burning of the plastic waste either at the dumpsites or by the households/cottage industry leads to the emissions of UPOPs. Also, the methods used by the recyclers lead to the emissions of UPOPs.

Some of the plastics used for electronic products and the Polyurethane Foam products used for mattresses, cars etc. contain flame retardants. One of the types of flame retardants that were used historically are PBDEs. When the plastic scrap containing PBDE is recycled or disposed of, there is a release/emission of PBDE. PBDE is a POP and is listed in Annex A (elimination) of the Stockholm Convention. Thus, the countries which have ratified the SC are required to address the release/emission of PBDE.

The project aims to help Indonesia in preventing PBDEs from entering the recycled material and from being released into the environment. The other objective of the project is to reduce the release of UPOPs

<sup>3</sup> Source: Project Document

due to recycling, manufacturing, and disposal of plastic 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 by introducing alternatives to PBDEs in plastics manufacturing processes and the application of BAT/BEP in plastics recycling and disposal practices.”

### 2.3 Immediate and development objectives of the project

The global environmental benefits of the project were the reduction in the emission of UPOPs and PBDE. The global environmental objectives of the project were linked with the effectiveness of waste management in the country. The rationale of the project is that best practices for plastic waste management lead to improvement in the local environment. The design of this project correlates to the main objective of safeguarding the country to prevent and mitigate undue harm to the environment and people at the earliest possible planning stage and to identify and realize opportunities to strengthen environmental and social sustainability.

### 2.4 Baseline and expected results

As per the ‘Project Document’ in the baseline situation, the plastics recycling industry in Indonesia lacks good organization and technological resources and is mostly the recycling activities are carried out in the unorganized sector. The activities of plastic waste recycling/disposal are carried out in the manner which is not environmental-friendly, leading to pollution. In the baseline situation there are no regulations to control the emissions of UPOPs and PBDE due to plastic recycling activities.

The expected results out of the project were PBDEs and UPOPs releases to the environment reduced through, regulations and policy measures; and through implementation of appropriate disposal options for hazardous and unrecyclable plastic waste fractions from both formal and informal recyclers and waste collectors.

### 2.5 Main stakeholders

Table 6 provides the details of the stakeholders for the project.

**Table 6: Stakeholders for the project (as per Project Document)**

	Government	Civil Society	Private Sector	Development Partners
Key stakeholders	<ul style="list-style-type: none"> <li>• Ministry of Industry</li> <li>• Ministry of Environment and Forestry</li> <li>• Ministry of Finance (Customs)</li> <li>• National Agency of Drugs and Foods Control (BPOM)</li> <li>• Local government agencies (BAPPEDA) Mojokerto</li> <li>• Local Office of Environmental Management</li> </ul>	<ul style="list-style-type: none"> <li>• Yayasan</li> <li>• Konsorsium Lingkungan Hidup</li> <li>• (KLH), Ecoton,</li> <li>• My Darling</li> <li>• Inspirasi.</li> </ul>	<ul style="list-style-type: none"> <li>• Perum Jasa Tirta,</li> <li>• APHINDO</li> <li>• GIATPI,</li> <li>• INAPLAS</li> <li>• AKIDA,</li> <li>• Packindo,</li> <li>• Rotokemas</li> <li>• Recycling groups, and suppliers</li> </ul>	<ul style="list-style-type: none"> <li>• GEF OFP</li> </ul>

Primary stakeholders	<ul style="list-style-type: none"> <li>• BAPPENAS</li> <li>• Ministry of Trade</li> <li>• Ministry of Health</li> <li>• Agency for Assessment and Application of Technology (BPPT)</li> <li>• Ministry of Energy and Mineral Resources (ESDM)</li> </ul>	<ul style="list-style-type: none"> <li>• Komite Nasional - Responsible Care Indonesia (KNRCI)</li> <li>• Prasadha</li> <li>• Pamunah Limbah Industri.</li> </ul>	<ul style="list-style-type: none"> <li>• Chandra Asri</li> <li>• Petrochemical, Styrimo Mono</li> <li>• Indonesia, Tri Polyta, Polytama, Titan</li> <li>• Petrokimia, PERTAMINA, Astra</li> <li>• Otoparts, and other manufacturing industries.</li> </ul>	<ul style="list-style-type: none"> <li>• WHO</li> <li>• UNIDO</li> </ul>
Secondary stakeholders	<ul style="list-style-type: none"> <li>• Ministry of Home Affairs</li> </ul>	<ul style="list-style-type: none"> <li>• Family Welfare Movement (PKK), Youth Group</li> <li>• “Karang Taruna.”</li> </ul>	<ul style="list-style-type: none"> <li>• Surveyor Indonesia</li> <li>• Sucofindo.</li> </ul>	<ul style="list-style-type: none"> <li>• UNICEF</li> </ul>

### 3. FINDINGS: PROJECT DESIGN AND FORMULATION

The main questions for TE were: (please see Annex B for the evaluation questions)

- Were the project's objectives and outcomes clear, practicable and feasible within its time frame?
- Were the capacities of the executing institution(s) and its counterparts properly considered when the project was designed?
- Were lessons from other relevant projects properly incorporated in the project design?
- Were the partnership arrangements properly identified and roles and responsibilities negotiated prior to project approval?
- Were counterpart resources (funding, staff, and facilities), enabling legislation, and adequate project management arrangements in place at project entry?
- Were the project assumptions and risks well-articulated in the PIF and project document?
- Whether the planned outcomes were "SMART" (specific, measurable, achievable, relevant, and time-bound)?

#### 3.1 Analysis of Log Frame / Results Framework

The objective of the project was 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 also aimed at assisting the country in implementing its obligations under the Stockholm Convention, to reduce the releases of PBDEs and UPOPs, as well as strengthening the sound management of chemicals and waste to protect human health and the environment. The log-frame of the project, the indicators for monitoring and verification of the achievement (along with the baseline and target values for the indicators) were as given in Table 7.

**Table 7: Project Log-Frame (as per Project Document<sup>4</sup>)**

Intended Outputs	Indicators	Baseline situation	Targets Yr.1	Target Yr.2	Target Yr. 3	Target Yr. 4
<b>Component/ Output 1: Strengthening the National Policy and Regulatory Framework</b>						
<b>Activity Result/ Output 1.1: Strengthening the national policy and regulatory framework to reduce UPOPs and PBDE releases from plastics manufacturing, recycling, and disposal practices</b>						
<b>Objective: A specific technical by laws that contains the standard on PBDE handling and management is established, disseminated, and adopted.</b>						
	<i>Indicator 1.1</i> Technical by-laws and guidelines on PBDE handling and management	No technical by-laws and guidelines on PBDE handling and management.	A draft of specific technical by laws on PBDE handling and management is developed.	A specific technical by laws on PBDE handling and management is established.	3 associations and 3 companies gain information regarding the dissemination on specific technical by laws.	3 local government agencies, 3 community-based organizations (CBOs)/ non-government organizations (NGOs), and 3 more companies located in 3 provinces gain information concerning the implementation of specific technical by laws on PBDE handling and management.
	<i>Indicator 1.2</i> National standard on maximum PBDE	No national standard on the maximum use of PBDEs in a product.	A draft of specific national standard on the maximum PBDE	A specific national standard on the maximum	3 associations and 3 companies gain information regarding the	3 local government agencies, 3 CBOs/ NGOs and 3 more companies gain

<sup>4</sup> Prepared based on the Results and Resources Framework provided in the Project Document. Indicators has been numbered at the stage of the Terminal Evaluation (TE) for the ease of reference in the TE report. The terms Component and Output has been used, interchangeably in the Project Document. Similarly, terms Activity Result and Output has been used interchangeably.

Intended Outputs	Indicators	Baseline situation	Targets Yr.1	Target Yr.2	Target Yr. 3	Target Yr. 4
	concentration in products.		concentration in products is developed	PBDE concentration in products is established.	standard on the maximum PBDE concentration in products.	information regarding the implementation of the national standard on the maximum use of PBDE in products. 3 local government agencies,
	<i>Indicator 1.3</i> Functioning Extended Producer Responsibility (EPR) scheme for PBDE containing product groups	No EPR scheme for PBDE containing product groups.	A draft of EPR is developed.	3 associations and 3 companies are consulted concerning the draft of EPR.	3 more companies are consulted regarding the draft of EPR.	3 community-based organizations (CBOs)/ non-government organizations (NGOs), and 3 more companies located in 3 provinces gain information regarding the implementation of EPR.
<b>Component/ Output 2: Reducing or Eliminating the Importation and Use of PBDEs in Plastics Manufacturing</b>						
<b>Activity Result/ Output 2.1:</b> Sufficient national technical expertise built to meet challenges with PBDEs in manufacturing and plastic raw material recycling. <b>Objective:</b> Technical guidelines and standard on the plastic production and recycling.						
	<i>Indicator 2.1</i> Number of technical guidelines on the plastic production and recycling are developed	No technical guidelines on the plastic production and recycling	A draft of technical guidelines and standard on the plastic production and recycling is developed.	A technical guideline and standard on the plastics production and recycling is established.	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.	3 more plastic manufacturing companies and 2 plastic recycling companies receive information regarding the technical guidelines and standard of the plastic production and recycling.
<b>Activity Result/ 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. <b>Objective:</b> Plastic manufacturers have capacity to identify PBDE in their raw materials for production process and consider alternative substances.						
	<i>Indicator 2.2</i> Number of plastic manufacturers have comprehensive raw material checks for PBDEs.	No checking has been undertaken to identify PBDEs in both virgin and recycled, raw materials.	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.	Three more plastic manufacturers gain information on the danger of hazardous and toxic PBDEs and UPOPs.	Three more selected companies are willing to join the programme to reduce and phase-out PBDEs in their production process.	Three more selected companies have tools to identify PBDEs.
<b>Component/ Output 3: Reducing UPOPs and PBDEs from Unsound Plastics Recycling</b>						

Intended Outputs	Indicators	Baseline situation	Targets Yr.1	Target Yr.2	Target Yr. 3	Target Yr. 4
<b>Activity Result/ 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. <b>Objective:</b> Plastic recycling sector has capacity to identify and improve technical practices in handling, storing, recycling, and disposing PBDEs containing wastes.						
	<i>Indicator 3.1</i> Gender disaggregated data on recyclers.	Unavailability data on gender-based recyclers.	A gender segregated data on recyclers is collected	3 capacity building programs that cover the interest of both women and men workers are undertaken.	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 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.
	<i>Indicator 3.2</i> Number of plastic recyclers whose capacity to identify PBDEs and process plastic waste to BAT/BEP is increased.	No plastic recyclers have capacity to identify PBDE and process plastic waste.	Three recycling companies are trained to understand the danger of hazardous and toxic PBDEs.	3 more recycling companies gain understanding on the danger of hazardous and toxic PBDEs.	3 selected companies have tools to identify PBDEs and dispose PBDEs containing goods.	3 more selected companies have tools to identify PBDEs and willingness to dispose PBDEs containing goods.
	<i>Indicator 3.3</i> Rudimentary techniques for plastic processing applied in plastic recycling clusters.	No application of BAT/BEP in plastic recycling activities.	A draft of technical guideline (BAT/BEP) for recycling sector is prepared.	A technical guideline (BAT/BEP) for recycling sector is established.	The established technical guideline is integrated into 3 plastic recycling practices.	The established technical guideline is integrated into 3 more plastic recycling practices.
<b>Activity Results/ 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. <b>Objective:</b> Plastic recycling sector has capacity to identify and improve technical practices in addressing UPOPs						
	<i>Indicator 3.4</i> Tonnage of PBDE containing plastics separated and safely disposed	No data on PBDE containing plastics.	100 metric tons of PBDE containing plastic waste are separated and safely disposed.	500 metric tons of PBDE containing plastics waste are separated and safely disposed.	800 metric tons of PBDE containing plastics are separated and safely disposed.	1,000 metric tons of PBDE containing plastics waste are separated and safely disposed.
	<i>Indicator 3.5</i> Technical guidelines to separate PBDE containing plastics.	Technical guidelines to separate PBDE containing plastics.	A draft of technical guidelines to eliminate UPOPs is prepared	A technical guideline is established.	The technical guideline is integrated into 3 plastic recycling practices.	The established technical guideline is integrated into 3 more plastic recycling practices
<b>Component/ Output 4: Reducing releases of UPOPs and PBDEs from unsound plastic disposal practices</b>						
<b>Activity Results/ Output 4.1:</b> 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>Objective:</b> Disposal options for hazardous and unrecyclable plastics waste fractions from both formal and informal recyclers and waste collectors are established and implemented.						
	<i>Indicator 4.1</i> Number of mini depots for waste separation	Limited number of demonstrated mini depots in urban areas.	1 mini depo is prepared for waste	2 mini depots are prepared, and technical	3 mini depots are established in selected areas.	Additional 3 mini depots are functioning.

Intended Outputs	Indicators	Baseline situation	Targets Yr.1	Target Yr.2	Target Yr. 3	Target Yr. 4
	established at communities.		separation at community.	guideline is established.		
	<i>Indicator 4.2</i> Tonnage of waste diverted from river dumping.	10 tons/week of waste is dumped in Surabaya River. About 3 tons is dumped in Cikapundung River weekly.	1 ton/week of plastic waste diverted from river dumping in East Java.	4 tons/week of plastic waste diverted from river dumping in East Java.	6 tons/week of plastic waste diverted from river dumping in East Java.	8 tons/week of plastic waste diverted from river dumping in East Java.
	<i>Indicator 4.3</i> Additional tonnage of MSW undergoing sanitary landfilling and waste to energy treatment in Surabaya and Bandung.	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.	1 ton/week of waste diverted from river dumping in West Java.	4 tons/week of plastic waste diverted from river dumping in West Java	6 tons/week of plastic waste diverted from river dumping in West Java.	8 tons/week of plastic waste diverted from river dumping in West Java

Apart from the expected Outputs mentioned in the above Table, the results-based framework for the project has provided for monitoring, learning, adaptive feedback, outreach, and evaluation (Output 5); and Project Management Unit (Output 6). For achieving the Outputs of the project, the project design has provided for the specific activities detailed in Table 8.

**Table 8: Indicative Activities for Different Outputs (as per Project Document)**

Intended Outputs	Indicative Activities
<b>Output 1.1:</b> Strengthening the national policy and regulatory framework to reduce UPOPs and PBDE releases from plastics manufacturing, recycling, and disposal practices	<ol style="list-style-type: none"> <li>1.1. Develop National Standard on maximum PBDE content in products placed in the market.</li> <li>1.2. Develop and integrate a policy/ regulatory framework for PDDBE waste management in Solid Waste Management policy/ regulatory framework.</li> <li>1.3. Adopt technical by-laws, regulations and guidance aiming to reduce UPOPs/PBDE releases from plastics manufacturing, recycling, and disposal practices.</li> <li>1.4. Develop regulatory and policy framework pertaining to the import of PBDE and PBDE containing products and wastes and material with technical guideline for PBDEs and UPOPs reductions/elimination from waste process.</li> <li>1.5. Increase institutional and technical capacity to control the import of material streams potentially containing PBDEs, including policies for inspecting and monitoring PBDEs disposal</li> <li>1.6. Remove barriers to BAT/BEP implementation through economic instruments and incentives</li> </ol>
<b>Output 2.1:</b> Sufficient national technical expertise built to meet challenges with PBDEs in manufacturing and plastic raw material recycling.	<ol style="list-style-type: none"> <li>2.1.1 Detailed data analysis on PBDEs imported, handled, and applied in plastics manufacturing</li> <li>2.1.2. Sufficient in-country PDDBE capacity built for selection and identification of suitable PBDE alternatives.</li> </ol>
<b>Output 2.2:</b> PDDBE 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.	<ol style="list-style-type: none"> <li>2.2.1. Assistance for Quality assurance programmes for ensuring that PBDEs free plastic manufacturing</li> <li>2.2.2. Communication and awareness raising</li> </ol>
<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	<ol style="list-style-type: none"> <li>3.1.1 (In) formal entities handling/ processing significant quantities of PBDEs containing plastics as well as PBDEs and UPOPs specific challenges these entities encountered, identified.</li> </ol>

Intended Outputs	Indicative Activities
the introduction of BAT/BAP in the plastics recycling sector.	3.1.2. Total four large scale formal and informal plastics recycling clusters Mojokerto (East Java) and Bekasi (West Java) areas entities supported in implementing BEP/BAT. 3.1.3. Total 6 medium scale informal plastics recycling entities, at both recycling clusters supported in implementing BEP/BAT.
<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.	3.2.1. Develop technical guidelines to separate and eliminate UPOPs. 3.2.2. Establish technical guidelines in coordination with relevant stakeholders. 3.2.3. Conduct and establish regular re-collection systems (especially PBDE containing plastics). 3.2.4. Ensure separation on PBDE containing plastics (waste). 3.2.5. Dispose PBDE containing plastics in accordance with the guidelines
<b>Output 4:</b> 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.	4.1.1 Total 4 municipalities/ local governments in Surabaya and Bandung area supported in designating disposal options for PBDEs containing and unrecyclable plastic waste fractions' putting in place mitigation measures to avoid/reduce harmful releases to waters, particularly ocean bound river systems. 4.1.2. Appropriate municipal waste separation and collection schemes, feasible logistical arrangements, including proper waste acceptance and outbound material criteria, and solution for final disposal of unrecyclable plastic waste fractions (fitting both the needs of formal and informal recyclers/processors) developed and setup. 4.1.3. Recycling chains for local markets further developed, recycling rates increased, and maximum quantities of recyclable plastics diverted from inadequate disposal. 4.1.4. Designated PBDEs acceptance/disposal "points" staff trained in best approaches to reducing harmful releases and exposure at disposal sites.

Some of the issues with the project design and the log frame are as follows:

#### Issues related to Project Framework / Project Log-Frame:

- a) The project's result framework (Log-frame) has not provided any project level objective. Objectives have been mentioned at the Component/Output level in the Results Framework.
- b) At the Component/Output level in the results framework, the targets were, in terms of activities to be carried out, without relating such activities with the quantitative targets. At least for the UPOPs part of the project, it would have been good to have targets for emission reductions in quantitative terms. The tracking tool, prepared at the time of project design, do have the figures for the targeted reductions in the emissions of UPOPs.
- c) Activity Results/Output 1.1 mentions both PBDE and UPOPs. However, the indicators have covered only PBDE (there are no indicators for UPOPs).

#### Issues related to Project Design / Technical Activities

- d) Activity Result/ Output 1.1 pertains to establishment of the technical law that contains the standard on PBDE handling and management with the aim to reduce PBDE releases from plastic manufacturers, recycling, and disposal. In this regard, it is important to note that PBDE is in Annex A (elimination) of the Stockholm Convention. As per the provisions in the SC, for Hexabromodiphenyl ether and Heptabromodiphenyl ether, there are no exemption for production. However, use for producing articles in accordance with part IV of Annex A is allowed. Similarly, for Tetrabromodiphenyl ether and Pentabromodiphenyl ether, there are no exemption for production. However, use for production of articles in accordance with part V of Annex A is allowed. Indonesia, as a country, has not taken any exemption for the use of PBDE (it is not listed in the register of SC for exemptions). Thus, in Indonesia, the use of PBDEs need to be eliminated (and not regulated). This can be achieved by identifying PBDE containing plastic waste and eliminating it from the plastic recycling loop. As per Indonesia's 'Updated National Implementation

Plan for POPs<sup>5</sup> (updated NIP)', life cycle stages for PBDE are presently not regulated. Thus, this Output of the project will serve the purpose of providing a regulation for lifecycle states of PBDE in Indonesia.

- e) Across the world, there was termination in the production of the commercial Penta and Octa mixtures in 2004<sup>6</sup> (the production of commercial Deca mixture continued till 2014 but was used only for electronics and electrical applications in the EU). With this the only presence of PBDE may be in the form of inventory in the old products. The only possibility of PBDE getting into the newly manufactured plastic products is by way of use of recycled plastics (in part of in full) for the goods produced. As per the 'Updated NIP' Regarding POP-PBDEs, no information on production, use, export and import of cPenta- and c-OctaBDE in Indonesia could be gathered while preparing the 'Updated NIP'. The 'Updated NIP' has therefore computed cumulative inventory of POP-PBDEs from imported CRTs and their origin from local production minus (deducted by) exported CRTs during 1975-2012 and domestic car sale data of 1975-2004 and that of second-hand imported car. Considering that the production and use of PBDE stopped way back in the year 2004, much of this inventory of PBDE in the products would have already landed at the dumpsites in the form of waste (some of this waste would have got burned and some recycled). Still, there are possibilities of some old dumpsites and plastic recycling centres that would be contaminated with PBDE-containing material. In view of this, it is considered that Output 2.1 and Output 2.2 in the project design will be able to contribute towards the objectives of the project only to a limited extent. Further, as there is no fresh supply of PBDE in the overall cycle of production, use and recycle of plastics, the utility of the component of the project pertaining to PBDE will no more be there. Thus, there will be no need for long-term sustainability of the results and replication activities for the results of the project pertaining to PBDE.
- f) For Indicator 1.3, it is important to keep in mind that any regulation or policy for EPR will be applicable only for the products produced after the regulation/policy is approved. The possibility of PBDE getting into newly produced electronics products will happen only in cases where recycled plastic containing PBDE is used by the manufacturer. Thus, the EPR, once it becomes applicable, will have very minimal (if at all any) contribution towards addressing the emissions of PBDE. This is more of a 'project design' issue, rather than a shortcoming in the project implementation.
- g) For Output 2.1 and Output 2.2, the challenge is how the recyclers/plastic goods manufacturers would identify the PBDE containing plastic waste/recycled plastic. The issue is the availability of an affordable and practical method to identify PBDE containing materials at the level of plastic waste handlers/manufacturers of plastic goods. Although the project has supported some of the instruments for identifying PBDE containing plastic waste, their numbers are very limited, and given the cost, the possibility of the plastic waste collectors buying them is remote. This limitation of identifying PBDE containing plastic waste is also there in the case of Output 3.1.
- h) In the case of Output 3.2 is targeted at the reduction in the emission of UPOPs, but the corresponding activities are largely related to the reduction in the emission of PBDE. For activity 3.2.1, it needs to be appreciated that the formation of UPOPs happens in the process of disposal (by incineration) of plastic waste. Thus, the separation of plastic waste won't reduce the formation and release of UPOPs.
- i) In the case of Indicator 3.5, there is an issue with the identified indicator and the mentioned targets and baseline situation. Maybe it is a typo error.
- j) In the case of Indicator 4.2, it is important that, dumping of the waste in the river (as being done in the baseline situation) is not desirable from the environmental point of view. However, the dumping of plastic waste in the river does not lead to the emission of UPOPs (unless the plastic waste gets incinerated). It is not clear if, in the baseline situation, the plastic waste that would be collected

<sup>5</sup> Review and Update of National Implementation Plan for Stockholm Convention on Persistent Organic Pollutants in Indonesia - 2014

<sup>6</sup> Source: Section 2.2 of the document

BAT/BEP Guidance for the recycling and disposal of wastes containing PBDEs listed under the Stockholm Convention on POPs, UNEP. This document was initially developed in 2012 by UNIDO and the United Nations Institute for Training and Research (UNITAR), working in collaboration with the Secretariat of the Stockholm Convention and with financial support of the Global Environment Facility (GEF).

under the project gets incinerated. Further, it is not clear what would be done with the plastic waste diverted from dumping in the river and what would be the level of UPOPs emissions in the adopted disposal practice. Similar is the situation with Indicator 4.3.

The project design has not provided for any incentive (or making good the potential loss) for the plastic waste collector to take/handover any PBDE containing plastic waste for disposal at a designated place for safe disposal of PBDE containing plastic waste. Considering that any plastic waste collected by a waste picker/recycler is a means of livelihood for him and his preference would be to sell it to the recycling industry to recover the cost of collection and some earnings. It is recommended that the project is designed for the elimination of POPs/POPs containing material, provision is made for the cost of collection and safe disposal of the material (please see 'Lessons Learned' c).

As is evident, the four components of the project are not adequately supporting the objective of the project, and some of the targeted outcomes were not technically feasible. For example, it is not feasible that the plastic recyclers would develop the methods and capacity (which is affordable and feasible) to identify PBDE containing plastics. Not all the Outcomes were predictable, which means that at the time of project design, not all the activities and the corresponding Outcomes specified in the 'Project Design' are leading to the desired Outcomes/Objectives of the project.

The process of formation of UPOPs and POPs (other than UPOPs) are different. Although, the emissions pathways may, at times, be common (e.g., management of waste). The techniques required to address the emissions of UPOPs, and POPs are different. For example, in the case of UPOPs the emphasis needs to be on avoidance of formation, whereas, in the case of POPs the emphasis needs to be on destruction or limiting the use of the POP. It is recommended that for the projects that aim to reduce the emission of both POPs and UPOPs, the set of components/outcomes of the project should be separate for POPs and UPOPs (please see 'Lessons Learnt' e).

It is recommended that to ensure effectiveness/impacts of the projects relating to elimination/emission reductions of POPs (other than UPOPs), it would help to have a detailed assessment of the baseline line situation regarding the presence of the targeted POPs in the geographies (e.g., contaminated sites, contaminated equipment etc.) where the project is going to be implemented. Also, it would help if such a baseline assessment considers the status of the targeted POP in the Stockholm Convention and the status of production/use of the POP internationally. It would be useful to include this information in the Project Document, as it would help and provide some guidance to the team implementing the project (please see recommendation C.1).

It is recommended that for the project design, it would help if the indicators like reduction in the emission of POPs and UPOPs have a target value to be achieved during the implementation of the project and post project implementation (please see 'Lessons Learned' a).

When it comes to SMART (Specific, Measurable, Achievable, Relevant and Time-bound) indicators, there are issues with the Measurability and the Relevance of the indicators.

### **3.2 Assumptions and Risks**

At the time of PIF and at project design, a risk analysis of the project was carried out. The risks identified at the time of project design were included in the 'Project Document' (Annex B of the Project Document). Annex E provides the identified risks and the corresponding risk mitigation options. The risks identified included those which could have impacted the achievement of the results of the projects, as well as those which could have impacted the sustainability of the achieved results.

No additional risks were identified at the time of MTR and in the PIRs. Most of the assumptions made at the project design stage remained valid during the implementation of the project. The project assumptions and risks as given in the PIF and project document are well-articulated.

### 3.3 Lessons from other relevant projects

As per the 'Project Document', the project design has used the lessons from an Independent Assessment and Evaluation on the completion of the Tsunami Recovery Waste Management Programme (TRWMP). In the past, some of the projects pertaining to the management of POPs in Indonesia has been supported by GEF (with UNIDO as Implementing Partner). Particularly these activities were targeted initially for preparation of the NIP and later for updating of the NIP for POPs. There is no evidence to suggest the use of lessons from other projects at the time of the project design.

### 3.4 Planned stakeholder participation

In an earlier section (please see section 2.4), details of the important stakeholders of the project were provided. The project design has provided for the participation of important stakeholders in most of the planned activities of the project. Table 9 provides details of the planned stakeholders' participation for different Activities of the project.

**Table 9: Planned Stakeholder Participation (Compiled from Project Document)**

Activity	Planned Stakeholder Participation
Activity 1.1.1. Develop National Standard on maximum PBDE content in products	Ministry of Industry and the Badan Standard Nasional (BSN) will organize series of multi-stakeholder consultations with government agencies, industries, and customs agencies to have an agreement among stakeholders on accepted standard on maximum PBDE content in products placed on the market.
Activity 1.1.3. Adopt technical by-laws, regulations and guidance aiming to reduce UPOPs/PBDE releases from plastics manufacturing, recycling, and disposal practices	Dissemination of the regulations to stakeholders will be conducted to make all stakeholders aware of the regulations.
Activity 2.2.2. Communication and awareness raising	This activity will support the development of a full-fledged communications strategy in partnership with NGOs and CSOs involved in plastic recycling and waste management aiming at private industries including manufacturers, recyclers, and waste service providers as well as policymakers and local consumers to achieve specific and measurable behavioral changes with decision and policymakers at private businesses at provincial and national levels, as well as local (district) stakeholder groups in the field. Throughout the project, active participation of women and women's groups will be ensured in order to address the improvement of women's health and lives.
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	The activity will involve established plastic manufacturers/ third party intermediaries and recycling (plastic sorting) clusters
Activity 3.1.2. Large scale formal and informal plastics recycling clusters in Mojokerto (East Java) and Bekasi (West Java) supported in implementing BEP/BAT	It will include capacity building and training of waste traders, waste recipients and environmental authorities for the implementation of BEP/BAT adhering technologies for bulk plastic sorting, processing, and recycling.
Activity 3.1.3. Medium-scale informal plastics recycling entities at both recycling clusters supported in implementing BEP/BAT	This will be implemented in cooperation with medium-scale informal plastics recycling entities in the same pilot areas

Activity	Planned Stakeholder Participation
Activity 4.1.1. Municipalities/local governments in Surabaya and Bandung area supported in designating disposal options for PBDEs-containing and unrecyclable plastic waste fractions' putting in place mitigation measures to avoid/reduce harmful releases.	The authorities at Surabaya and Bandung area will receive technical assistance in the form of international expertise to separate PBDE containing plastics entering municipal waste streams, to establish sound disposal system integrated with other municipal hazardous waste for these and to minimize uncontrolled waste burning both from municipal and industrial sources
Activity 4.1.2. Appropriate municipal waste separation and collection schemes, feasible logistical arrangements, including proper waste acceptance and outbound material criteria, and solution for final disposal of unrecyclable plastic waste fractions developed and set-up.	The activities among the river communities will entail setting up pre-sorting facilities, coupled with composting and establishment of functioning reselling channels for recyclable waste.
Activity 4.1.3. Recycling chains for local markets further developed, recycling rates increased, and maximum quantities of recyclable plastics diverted from inadequate disposal	The possibility of involving local and regional plastics recycling related businesses will be explored to ensure its sustainability
Activity 4.1.4. Designated PBDEs acceptance/disposal "points" staff trained in best approaches to reducing harmful releases and exposure at disposal sites.	Technical assistance and capacity building training for the designated PBDEs acceptance/disposal "points" staff for improvement of their personnel protection measures, safe working conditions, standards and infrastructure and best approaches to reducing harmful releases and exposure of UPOPs and PBDEs as well as protecting their health and safety, especially in the informal sector and female workers.

### 3.5 Replication approach

The replication approach as provided in the project design is centered around creating the mechanism (using EPR) to support the waste collectors and recyclers to conduct appropriate activities to select and dispose PBDE containing plastic waste even after the project is completed. For the reduction in the emission of UPOPs part of the project, the replication approach is based on demonstration and lessons learned and knowledge of which approaches work in developing plastic waste management.

In this regard, it is important to note that as PBDE is largely required to be eliminated from the plastic recycling loop, a scheme to use EPR for financing the replication activity is not workable. However, the concept of EPR may still be used for addressing the problem of emissions of UPOPs due to the unsound disposal of non-recyclable plastics.

### 3.6 UNDP comparative advantage

Relating to the management of chemicals, UNDP's expertise covers Persistent Organic Pollutants (POPs), Ozone Depleting Substances (ODS), Mercury, Lead, and other heavy metals. UNDP helps countries strengthen their waste management systems, including waste prevention, reuse/recycling, treatment, and disposal. Safe and effective treatment of hazardous medical waste through innovative technologies is also one of the strength areas.

UNDP activities on chemicals and waste management are carried out in cooperation with the Global Environment Facility (GEF), the Multilateral Fund for the Implementation of the Montreal Protocol (MLF), the Inter-Organization Programme for the Sound Management of Chemicals (IOMC),

Secretariat of the Stockholm Convention on Persistent Organic Pollutants, Secretariat of the Minamata Convention on Mercury, and a broad range of bilateral, private sector and civil society partners.

The project builds on UNDP's strong experience in Indonesia with promoting environmental protection and building the capacity of governmental organizations and the public. In Indonesia, UNDP has implemented projects in diverse environment subject areas, including climate change (mitigation and adaptation), Ozone Depleting Substances (ODS) reduction and phase-out (Ozone Layer Protection), renewable energy, REDD, biodiversity conservation/protection, disaster risk reduction, integrated water resources management and sustainable land management, and chemicals management. UNDP also supports national partners in areas related to inclusive development, democratic governance, and other areas.

### 3.7 Linkages between the project and other interventions within the sector

The 'Project Document' provides details of the baseline projects in Indonesia. At the time of project design, the government of Indonesia has been very committed towards the management of solid waste (SW) in the country. The government had set targets to reduce waste volumes, increase recycling and improve the situation of SW in the country. Within the plastics manufacturing sector, the government had undertaken several measures for environmentally sound operations and management. Some of the baseline programs/projects are as follows:

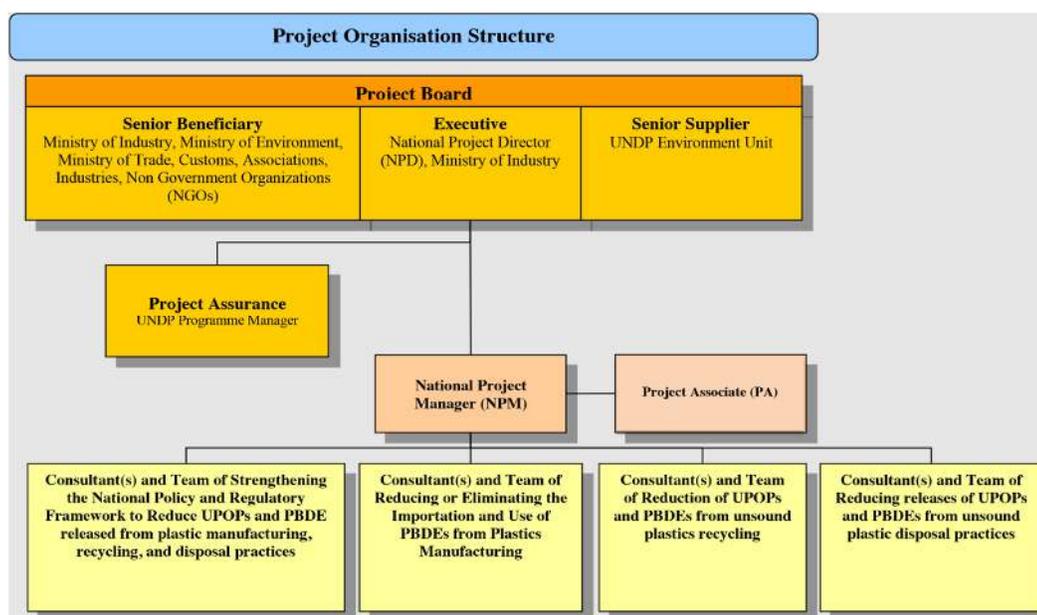
- As part of its sustainable development plan (2005-2025), the government of Indonesia has been carrying out a green economy strategy. Some of the specific initiatives include subsidies for industries as well as incentives to promote environmentally friendly products.
- Under the 'Blue Sky Program' (since 1996), a clean air programme had been implemented to control air pollutants in urban areas. This is under one of the Government Regulations on National Guidelines, for industries to consider 4R (reduce, reuse, recycle, and recovery), and sound management of toxic and hazardous substances, including POPs.
- With the support of WHO and the SAICM, Indonesia had strengthened its national capacity for sound management of priority industrial carcinogens.
- Continuation to promote awareness challenges and policy development-related to PBDEs, following the two awareness-raising workshops organised by the MOI and UNDP.
- Implementation, further development of guidance and enforcement Decree of Minister of Industry and Trade on Restriction and Monitoring on the Import, Distribution, and Production of Dioxin Contaminated Goods.
- In 2007, the government started and had been continuously implementing and widening a 3R programme at the communal scale, which has been initiated in 33 provinces to support waste segregation (paper, plastics, glass, metal), composting, and recycling.
- Formulation of a regulation and policy on electronic waste treatment and disposal. The e-waste regulation focused on distinguishing between e-waste and second-hand equipment as well as management approaches through i) Extended Producer Responsibility; ii) national and provincial government participation; iii) economic instruments (incentives and disincentives); and the 3R programme.
- Implementation and further development of guidance and enforcement of Ministry of Trade's Decree concerning imports of used products for reconditioning, remanufacturing or re-use.
- Implementation and further development of guidance and enforcement of Ministry of Trade's Decree concerning importation of Non-Hazardous Waste.
- Further expansion on the Reuse, Reduce, Recycle (3R) programme and reduction of uncontrolled burning of waste through the improvement MSW disposal sites in 240 cities; and the development of landfill gas projects in 24 major cities.

Several large cities have ongoing initiatives to support methane gas recovery for energy generation or reduce methane generation through aerobic composting.

### 3.8 Management arrangements

The project has been executed through the National Implementation Modality (NIM) of UNDP with the Ministry of Industry as the ‘Implementing Partner.’ The Ministry of Industry, as ‘Implementing Partner’ was responsible and accountable for managing the project, including the monitoring and evaluation of project interventions, and achieving project outputs, and for effective use of the project resources. A National Project Director was designated by the Implementing Partner to oversee and provide appropriate guidance to the UNDP-Project Management Unit, which managed day to day activities of the project.

Figure below provides the management structure (source: Project Document) for the implementation of the project.



UNDP was responsible for (i) the identification and recruitment of project and programme personnel, (ii) procurement of goods and services, (iii) provision of administrative support required to deliver the outputs. UNDP also provided technical guidance, administrative and managerial support, and oversight to the project.

A ‘Project Board (PB)’ was constituted, which was responsible for making management decisions for the project, when strategic guidance and decisions were required. The PB was comprised of (1) National Project Director (Director level of Ministry of Industry); (2) the Beneficiaries, i.e., representatives of directorates of relevant ministries (Ministry of Industry, Ministry of Environment and Forestry, Ministry of Trade, Customs), associations, industries, and NGOs; and (3) the Supplier, i.e., UNDP.

A professional Project Management Unit (PMU), comprising of technical experts and administrative personnel, under the guidance of a Project Manager, was responsible for the day-to-day implementation of the project activities. The Project Manager and Project Management Unit were accountable to the NPD for the sound administrative and financial management of the project as well as effective delivery of project activities.

There were two provincial pilot areas working on project Components 3 and 4. The two pilot areas were in Surabaya and Bandung. The project worked with local government agencies, companies that work on plastic waste and plastic recycling activities as well as non-governmental organizations (NGOs) and community groups active in waste and recycling activities.

### **3.9 Social and Environmental Safeguards**

Social and Environmental screening (as per UNDP Social and Environmental Screening template) of the project was carried out and submitted along with the request for CEO endorsement.

The screening process identified that the project includes the activities and outputs that support upstream planning processes, that potentially pose environmental and social impacts or are vulnerable to environmental and social change. However, the SES results, submitted at the time of request for CEO endorsement mention that impacts and risks are limited in scale and can be identified with a reasonable degree of certainty and can be handled through application of standard best practice. There is no specific mention of SE safeguard, except the Annex F of the project document mentions, that Environment and Social Screen results were submitted separately, at the time of submission of the project.

### **3.10 Gender Responsiveness**

Under Output 5 (Monitoring, learning, adaptive feedback, outreach, and evaluation) the project design has provision for preparation of the guidance for M&E with gender consideration. The preparation of this guidance was to be done in the first year of project implementation. The results framework of the project has provided for gender segregated indicators.

Considering that women and children are involved in the activities of collection and processing of plastic waste collection and recycling, the project design has provided for addressing the concerns of vulnerable groups including women workers to assess and strengthen their capacity to properly manage PBDEs recycling and waste. Otherwise also promotion of the proper collection and processing/disposal of plastic waste will lead to reduction in the health risks to women workers. The project also planned active participation and engagement of women's groups.

## 4. FINDINGS: PROJECT IMPLEMENTATION

### 4.1 Adaptive management and Feedback from M&E used for adaptive management

The main questions for the TE were: (please see Annex B for the evaluation questions)

- Did the project undergo significant changes because of recommendations from the mid-term review? Or because of other review procedures? Explain the process and implications.
- If the changes were extensive, did they materially change the expected project outcomes?
- Were the project changes articulated in writing and then considered and approved by the project steering committee?
- Whether feedback from M&E activities was used for adaptive management?
- Whether changes were made to project implementation because of the MTR recommendations?

Monitoring and Evaluation activities for the project has been quite strong. Annual work plans and annual reports were prepared regularly. The MTR of the project was started in April 2019 and was completed in June 2019. There was a delay in the MTR. The MTR of the project did not recommend any significant change in the project except for an extension in the implementation timeline of the project.

One of the recommendations of the MTR was that PMU and MOI work together to 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 was suggested that about 5,000 measurements could be carried out using XRF and carry out at least 1% of confirmatory analysis with GC/MS, for an overall number of 5,050 analyses. In response to this recommendation, it was suggested by the project team that there are barriers and limitations around identifying PBDE containing plastics. As a follow up of the recommendations during MTR, the project team initiated the 'Training of Trainers' program, with the Ministry of Industry and Association of Recyclers and Manufacturers, procured some equipment for mini depots in Depok, Malang Regency, Malang Municipality, Bandung, and Banyuwangi. This was to make up for the shortcoming in the quantum of PBDE plastic eliminated by the project, as was mentioned in the MTR report.

MTR recommend a no-cost extension to the project to address the risk that all project activities may not be completed in a satisfactory manner by the original implementation timelines of the project. Accordingly, the project was granted a no-cost extension. There was no change in the project implementation due to the MTR.

### 4.2 Partnership arrangements

The main questions for TE were: (please see Annex B for the evaluation questions)

- Were there adequate provisions in the project design for consultation with stakeholder?
- Whether effective partnership arrangements were established for implementation of the project with relevant stakeholders involved in the country/region, including the formation of a Project Board?

As mentioned in section 3.4, the project design had adequate provisions for stakeholder consultation and participation. The project has been implemented under the 'National Implementation Modality (DIM)' of UNDP. The project design provided for a 'Project Board' as the main tool for national stakeholder engagement into the project planning and implementation. The 'Project Board' had representatives from key partners for project implementation and the project's beneficiaries. As per the project design, the other opportunities for formal engagement of stakeholders (including local governing bodies) were by the way implementation of pilot projects (mini depots), training sessions, conferences, workshops, awareness creation, results dissemination etc. It took time for the project to get the local governing bodies on board for the allocation of land for the construction of the mini depots. Due to this reason, the activity of the creation of mini depots at some of the locations got delayed. Maybe it would have helped

if the local governing bodies were taken on board at an early stage of project implementation. Still better, the local governing bodies at the pilots' location could have been the implementation partners and had representation in the 'Project Board' (please see 'Lessons Learned' d).

The project established an effective partnership arrangement for the implementation of the project with the other (other than the government counterparts) relevant stakeholders as well. This included the partnership with the private companies for recycling of plastic, suppliers of equipment for the mini depots.

Some of the other partnerships established under the project included with the Ministry of Environment and Forestry, local government agencies (BAPPEDA) at Mojokerto, Local office of Environmental Management, Ministry of Industry, Plastic manufacturers/ third-party intermediaries, and recycling (plastic sorting) clusters, informal plastics recycling entities.

The project design and implementation missed out on one of the important stakeholders, that is the cement kilns (or other places for safe disposal of plastic waste), where PBDE containing plastic waste and non-recyclable plastic waste can be disposed of in a manner which doesn't lead to emission of PBDE and UPOPs (please see 'Lessons Learned' b).

The project established partnership with the Government, Plastics and Recycling Associations, NGOs from environmental sectors, women's groups, and people with disabilities, to address the issues which are specific to these venerable sections of the society. The project also collaborated with the Agency for Assessment and Application of Technology (BPPT), Centre for Material and Technical Product (B4T) Bandung, Centre for Chemical and Packaging (BBKK) Jakarta and 5 local universities.

### 4.3 Project Finance

The main questions for TE were: (please see Annex B for the evaluation questions)

- Whether there was sufficient clarity in the reported co-financing to substantiate in-kind and cash co-financing from all listed sources?
- What are the reasons for differences in the level of expected and actual co-financing?
- To what extent project Outcomes supported by external funders were well integrated into the overall project?
- What is the effect on project outcomes and/or sustainability from the extent of materialization of co-financing?
- Whether there is evidence of additional, leveraged resources that have been committed as a result of the project?

Table 10 provides the details of the provisions for the financing of the project.

**Table 10: Project Budget and GEF Funding<sup>7</sup> (Figures in USD)**

Outcome	Year 1	Year 2	Year 3	Year 4	Total
Total Outcome 1	131,500	205,500	172,500	117,500	627,000
Total Outcome 2	177,500	197,500	173,500	119,500	668,000
Total Outcome 3	376,500	381,500	354,500	392,500	1,505,000
Total Outcome 4	117,500	322,500	347,500	112,500	900,000
Total Outcome 5	11,000	36,500	11,000	41,500	100,000
Project Management - GEF Contribution	47,000	48,000	47,000	48,000	190,000
Project Management - UNDP Contribution	10,000	10,000	10,000	10,000	40,000
Project Total (GEF Only)	861,000	1,191,500	1,106,000	831,500	3,990,000
Project Total (Incl. UNDP)	871,000	1,201,500	1,116,000	841,500	4,030,000

<sup>7</sup> As per Project Document

The project design has provided for a significant amount as a co-financing contribution for the project.

The planned co-financing and the actual co-financing were well integrated in different Outcomes of the project. For example, co-financing support was used for development of mini-depots with additional resources. Table 11 provides details of the co-financing for the project.

**Table 11: Co-Financing committed at the time of project approval<sup>8</sup> (Figures in USD)**

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Co-financing Amount
National Government	Ministry of Industry	In-kind	5,000,000
Private Sector	APHINDO	In-kind	12,000,000
Private Sector	Perum Jasa Tirta	In-kind	1,525,188
Local Government	Konsorsium Lingkungan Hidup	In-kind	166,406
GEF Agency	UNDP	Cash	40,000
<b>Total Co-financing</b>			<b>18,731,594</b>

The in-kind contribution committed by different agencies got realized during the implementation of the project. All the activities which were committed as in-kind contribution was carried out by the agencies. Table 12 provides the details of the in-kind financing provided by different agencies.

**Table 12: In-kind Contributions by different agencies<sup>9</sup>**

Name of Entity	Description of responsibilities in the project's implementation (considered co-financing contributions)	Amount (USD)
Ministry of Industry	<ul style="list-style-type: none"> <li>Finalize the draft of act of Chemical Substances initiated by Directorate of upstream chemical industry</li> <li>Provide New GC-MS for Centre for Packaging and Chemical, MoI</li> <li>Develop Green Industry Standard</li> <li>Technical Meeting</li> </ul>	5,000,000
APHINDO	<ul style="list-style-type: none"> <li>Develop a wastewater treatment plant</li> <li>Develop Industrial standard</li> <li>Dissemination on government regulation</li> <li>Promote greening products</li> <li>Promote on resource efficiency and circular economy</li> <li>Technical meeting</li> </ul>	12,000,000
Perum Jasa Tirta		1,525,188
Konsorsium Lingkungan Hidup	<ul style="list-style-type: none"> <li>NGO</li> </ul>	166,406
Government of Babakan Village, Cirebon District, West Java	<ul style="list-style-type: none"> <li>Procurement of 600M2 land at Babakan Village for Mini Depot</li> </ul>	25,614
Government of Bandung City West Java	<ul style="list-style-type: none"> <li>Procurement of 7,8x36 M2 land at Holis, Bandung City for Mini Depot</li> </ul>	99,893
Government of Malang District East Java	<ul style="list-style-type: none"> <li>Procurement of 12x10 M2 land at Talang Agung, Kepanjen, Malang District for Mini Depot</li> <li>Building Renovation at TPA Talangagung, Kepanjen, East Java</li> </ul>	15,795
<b>Total</b>		<b>18,832,896</b>

#### 4.4 Monitoring and evaluation: design at entry

The main questions for TE were: (please see Annex B for the evaluation questions)

<sup>8</sup> Source: GEF CEO Endorsement Request

<sup>9</sup> Source: Figures provided by PMU

- Is the M&E plan well-conceived at the design stage?
- Is M&E plan articulated sufficient to monitor results and track progress toward achieving objectives?
- Was the M&E plan sufficiently budgeted and funded during project preparation and implementation?
- How effective are the monitoring indicators from the project document for measuring progress and performance?

A monitoring and evaluation plan was put in place at the time of the design of the project. There was a provision to review the plan at the time of project inception. As per the plan, the project was to be monitored through periodic quarterly and annual monitoring. There were provisions for the preparation of the PIR. The PIR combines both UNDP and GEF reporting requirements. Provisions were also made in the project design for an independent MTR and the TE. The GEF Focal Area Tracking Tool for POPs was also to be prepared at the time of CEO endorsement and before the MTR and at the TE. As per the plan stipulated in the project document, the project team was to prepare a Project Terminal Report, to summarize the results achieved (objectives, outcomes), lessons learnt, problems met and areas where results may not have been achieved. The set of indicators to be monitored and the corresponding targets were provided in the log-frame of the project. The results of the monitoring and evaluations were to be provided to the project board.

As is evident, the M&E plan at the design stage was well conceived. The plan was well articulated and was sufficient to monitor results and track the progress toward achieving the objectives, except for issues with some of the indicators used. Adequate provisions were made in the budget for monitoring and evaluation activities. **The M&E design at entry has been rated as Satisfactory.**

#### 4.5 Monitoring and evaluation: implementation

The main questions for TE were: (please see Annex B for the evaluation questions)

- Whether the logical framework was used during implementation as a management and M&E tool?
- What has been the level of compliance with the progress and financial reporting requirements/ schedule, including quality and timeliness of reports?
- What has been the effectiveness of the monitoring reports and evidence that these were discussed with stakeholders and project staff?
- What is the extent to which follow-up actions, and/ or adaptive management, were taken in response to monitoring reports (APR/PIRs)?
- Whether APR/PIR self-evaluation ratings were consistent with the MTR. If not, were these discrepancies identified by the project steering committee and addressed?

As mentioned before, the Monitoring and Evaluation activities have been quite strong. The monitoring reports were produced regularly and shared with the 'Project Board'. The reports were discussed at the steering committee meetings, and the required instructions and actions suggested by the board were carried out.

While preparing the periodic reports, the project results framework and the corresponding indicators were used, which ensured that the project team remained focused towards achieving the projected results of the project. The PIR self-evaluation ratings were more or less consistent with the MTR except for Component 3 of the project. For Component 3 of the project, the rating for progress towards results for Output 3.1 was Unsatisfactory (against 'On Track in the PIR 2018) and that for Output 3.2 it was Moderately Satisfactory (against the assessment of 'On Track' in the PIR). Cross cutting issues were monitored and reported in the PIRs.

**M&E Plan Implementation has been rated as Satisfactory. The overall quality of M&E is rated as Satisfactory.**

## 4.6 UNDP and Implementing Partner/execution coordination and operational issues

The main questions for TE were: (please see Annex B for the evaluation questions)

- Whether there was an appropriate focus on results?
- Was there adequate UNDP support to the Implementing Partner and project team?
- Quality and timeliness of technical support to the Implementing Partner and project team
- Were the management inputs and processes, including budgeting and procurement adequate?

The management arrangements as presented in the Project Document had been clearly described and were based on a common project management arrangement for UNDP National Implementation Modality (NIM). The project has fully followed the management arrangements as described.

A Project Management Unit (PMU) was established. The PMU assisted the Ministry of Industry and other stakeholders in performing their respective roles as implementing partners. The Project Manager/Coordinator runs the project on a day-to-day basis on behalf of the Implementing Partners. PMU followed UNDP procedures on implementation of NIM projects.

UNDP country office provided overall program, administrative, and financial oversight of the project progress in accordance with the common UNDP procedures and tracking tools available in the Atlas system. Considering the issues with the procurements using the national processes, UNDP helped with the procurement using its own procurement processes. The Project Board performed as a key decision-making body at a project strategic planning level. **Quality of UNDP Execution has been rated as Satisfactory.**

The project inception happened in a timely manner, and the project's implementation started in a timely manner. There were delays in implementing some of the activities, e.g., construction of mini depots, arrangements for safe disposal of PBDE containing plastic waste and non-recyclable plastic waste. These delays are largely attributable to the absence of arrangement with the local governing bodies and with the facilities where safe disposal of the plastic waste can be carried out. The land ownership issues at the proposed sites for mini depots were not addressed adequately at the time of the start of the project implementation. However, the project implementation team was able to make up for the delays in the establishment of the mini depots with the extended timelines for project implementation.

UNDP as GEF Implementing Partner collaborated effectively with the Implementation Partners. Project management and administration have been satisfactory. **The quality of Implementation by the Implementation Agency is rated as Satisfactory.**

## 4.7 Risk Management

MTR of the project did not identify any significant risk to the project. The PIR for the year 2019 identified significant risks. These risks were for establishment of the Mini Depots. The development of mini depot in Mojokerto in East Java had a significant delay due to the issues relating to the ownership of the land where the mini depots were to be established. As an adaptive measure the project for the other depots significant effort were made to obtain land clearances before proceeding with other activities. One of the other risks identified in PIR 2019, pertains to operational PBDE disposal. This was largely due to limited baseline data on PBDE products in Indonesia. In order to address this risk, the project to conducted an assessment study on identification of PBDE products in the market in East Java and West Java. Since 2017 until 2018, several surveys were held by using XRF by screening 500 samples. After laboratory analysis, 16 samples were PBDE contained (above 1000 ppm). Survey and laboratory analysis took times because it is difficult to find PBDE reference standard which is required for GC-MS laboratory procedure. PBDE reference was imported from China and need legal import documents that took long time to release. One of the other risks identified is the lack of facilities for

safe an environmentally sound disposal of PBDE containing plastic waste. To address this risk the project carried out negotiation with the Cement Kilns so that they receive PBDE containing plastic waste for safe disposal in the cement kilns by co-firing as fuel. PIR for years 2016, 2017 and 2018 did not identify any significant risk.

## 5. FINDINGS: PROJECT RESULTS

### 5.1 Attainment of Results

The main questions for TE were: (please see Annex B for the evaluation questions)

- What has been the achievements of the objectives against the end of the project values of the log-frame indicators, with indicators for outcomes indicating baseline situation and target levels, as well as position at the close of the project?

A finding regarding the attainment of the project objectives is presented in this section of the report. The objective of the project was to assist Indonesia in implementing its relevant obligations under the Stockholm Conventions. In particular, the objective was to reduce the release of PBDE and UPOPs. As per the project document, the objectives of the project were to be achieved through the implementation of the following four components leading to specific Outcomes.

<b>Component/ Output 1: Strengthening the National Policy and Regulatory Framework</b>	Activity Result/ Output 1.1: Strengthening the national policy and regulatory framework to reduce UPOPs and PBDE releases from plastics manufacturing, recycling, and disposal practices
<b>Component/ Output 2: Reducing or Eliminating the Importation and Use of PBDEs in Plastics Manufacturing</b>	Activity Result/ Output 2.1: Sufficient national technical expertise built to meet challenges with PBDEs in manufacturing and plastic raw material recycling. Activity Result/ Output 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.
<b>Component/ Output 3: Reducing UPOPs and PBDEs from Unsound Plastics Recycling</b>	Activity Result/ 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. Activity Results/ 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 practices at recycling entities.
<b>Component/ Output 4: Reducing releases of UPOPs and PBDEs from unsound plastic disposal practices</b>	Activity Results/ Output 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

Achievement of the results of the projects as presented in this chapter of the report has been carried out for the above four components of the project and the corresponding Outputs. Achievement of different Components (and the corresponding Outcomes) of the project in terms of indicators has been presented first, which is followed by the presentation regarding the achievement of project objectives. The achievement of the project objectives has been assessed in terms of the achievement of results for different Outputs of the project (as the project design has not provided the indicators at the objective project level)

In this section of the report achievement of results has been presented only for components 1 to 4, as the deliberations regarding monitoring, adaptive feedback, outreach, and evaluation have already been

presented in the earlier sections of the report. The evaluation of the attainment of results has been carried out in terms of the indicators of the log-frame. Wherever relevant, the reasons for non-attainment of the target values of the indicators have also been provided.

The mandatory ratings for the attainment of overall results have also been provided. Although the rating is not mandatory for achievement against each Indicator, the rating has been provided. This has been done to facilitate the ratings for the individual Component of the project and the project at an aggregate level. The evaluation of the attainment of overall results has been carried out keeping in mind the main questions for TE, as given in the box at the beginning of this section.

### 5.1.1 Attainment of Results– Component 1/Output 1

Component 1 of the project was to support government entities in enhancing the policy and regulatory framework regarding the PBDE content in the plastic. Which was to be followed up with the activities towards dissemination to the stakeholders. As per the project design (Project Document), the expected Outcome for Component 1 of the project was as given below.

Output 1.1: Activity Result/ Output 1.1: Strengthening the national policy and regulatory framework to reduce UPOPs and PBDE releases from plastics manufacturing, recycling, and disposal practices

Indicative activities that were to be carried for achieving Output 1.1 of Component 1, were provided in Section 3.1 (please see Table 8). Table 13 provides details of the achievement of the results for the Output of Component 1.

**Table 13: Results: Component 1/Output 1.1: Strengthening the National Policy and Regulatory Framework**

Indicator <sup>10</sup>	EOP Target	Status at MTR	Status at PIR 2020 <sup>11</sup>	Status at TE	TE Rating <sup>12</sup>
<b>Output 1.1</b>		<b>MTR Rating: MS</b>			
<ul style="list-style-type: none"> <li>• <i>Indicator 1.1</i> Technical by-laws and guidelines on PBDE handling and management</li> </ul>	<ul style="list-style-type: none"> <li>• Specific technical by laws on PBDE handling and management is developed.</li> <li>• EOP: 3 associations, 6 companies 3 local government agencies, 3 CBOs/ NGOs, gain information regarding the dissemination on specific technical bylaws</li> </ul>	<ul style="list-style-type: none"> <li>• Draft on the 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> </ul>	<ul style="list-style-type: none"> <li>• 90% completion</li> <li>• Technical guidelines on PBDE handling and management for plastic manufacturers and recycling industries</li> <li>• Guidelines disseminated to 18 plastic manufacturers, 15 recycling industries, 4 plastic manufacturer associations, 5 recycling</li> </ul>	<ul style="list-style-type: none"> <li>• Draft on the 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>• Technical guidelines on PBDE handling and management</li> </ul>	MS (please see the details provided in the paragraphs following this Table)

<sup>10</sup> The indicators were not numbered in the 'Project Document'. The numbering has been done at the time of TE to facilitate the discussion and reference

<sup>11</sup> Self-assessment by the project team in PIR for the year 2020

<sup>12</sup> Rating Scale; 6. Highly Satisfactory (HS): no shortcomings; 5. Satisfactory (S): minor shortcomings; 4. Moderately Satisfactory (MS): moderate shortcomings 3. Moderately Unsatisfactory (MU): significant shortcomings; 2. Unsatisfactory (U): major problems; 1. Highly Unsatisfactory (HU): severe problems

Indicator <sup>10</sup>	EOP Target	Status at MTR	Status at PIR 2020 <sup>11</sup>	Status at TE	TE Rating <sup>12</sup>
			association and 10 governments	for plastic manufacturers and recycling industries <ul style="list-style-type: none"> <li>• Training material for training plastic manufacturers, recycling industries, plastic manufacturer associations, recycling association and governments</li> </ul>	
<i>Indicator 1.2</i> National standard on maximum PBDE concentration in products.	<ul style="list-style-type: none"> <li>• Specific national standard on the maximum PBDE concentration in products is developed</li> <li>• EOP: 3 associations and 6 companies, 3 local government agencies, 3 CBOs/NGOs, 3 local government agencies gain information regarding the standard on the maximum PBDE concentration in products.</li> </ul>	<ul style="list-style-type: none"> <li>• Draft for national standard for power banks</li> <li>• Draft on Indonesia National Standard (SNI) for Plasticized Polyvinyl Chloride (UPVC) product was being developed and published in 2018</li> </ul>	<ul style="list-style-type: none"> <li>• 90% completion</li> <li>• The National Standard (SNI) for Plasticized Polyvinyl Chloride</li> <li>• The National Standard (SNI) for power banks (SNI number 8785:2019)</li> <li>• The national standard (SNI) on PBDE Testing (SNI IEC 62321:2015) revised and submitted to BSN.</li> </ul>	<ul style="list-style-type: none"> <li>• Indonesia Standard for Unplasticized PVC (UPVC) window frames made from UPVC.</li> <li>• Indonesia Standard SNI 8785 for 'Power Banks'</li> </ul>	MS (please see the details provided in the paragraphs following this Table)
<i>Indicator 1.3</i> Functioning EPR scheme for PBDE containing product groups	<ul style="list-style-type: none"> <li>• A draft of EPR is developed.</li> <li>• EOP: 3 associations, 9 companies, 3 CBOs/NGOs, are consulted/gain information concerning the draft of EPR</li> </ul>	<ul style="list-style-type: none"> <li>• Draft on EPR scheme for potentially PBDEs/ UPOPs releasing product</li> </ul>	<ul style="list-style-type: none"> <li>• 100% achieved</li> <li>• EPR document is finalized. However, it takes time for the EPR to be enforced.</li> </ul>	<ul style="list-style-type: none"> <li>• Draft of the EPR document.</li> </ul>	MS (please see the details provided in the paragraphs following this Table)

#### Indicator 1.1

The regulation and the decree are at the draft stage. Approval by the government is presently not in sight. As was shared earlier (please see section 3.1. bullet point c), the Technical by-laws and guidelines on PBDE handling and management will serve a limited purpose of providing regulation for lifecycle states of PBDE in Indonesia, but its contribution towards the objective of the project (reduction in the emission of PBDE) would at best be very limited. This is because the production and use of PBDE has stopped long back in the world (the only remote possibility is the presence in some of the plastic goods produced using recycled plastic scrap).

#### Indicator 1.2

Indonesia Standard for Unplasticized PVC (UPVC) is for window profiles etc. made from UPVC. Table 6 of the standard mentions the permissible limit of PBDE as 0.1 PPM. In this regard it is important to note that, technically unplasticized PVC products must be essentially made from the virgin PVC polymer, and there is no possibility of using recycled plastic for this product. With no production and availability of PBDE in the world and with no possibility of using recycled material for UPVC products, the provisions in the standards limiting the concentration of PBDE is not serving the objective of reducing the emissions/ harmful effects of PBDE.

Table 8 in the Standard SNI 8785 for 'Power Banks' mentions permissible concentration of PBDE as 1000 PPM. Technically, there is a possibility of usage of PBDE containing recycled plastic material for the 'Power Banks'. However, the share of 'Power Banks' in the overall usage of plastics (of plastics in the electronics industry) is insignificant.

Apart for the two specific standards (for UPVC and Power Banks) providing for the maximum limits regarding the concentration of PBDE, a national standard on PBDE Testing (SNI IEC 62321:2015) was revised and submitted to BSN.

### *Indicator 1.3*

The project has supported preparation of the draft document for implementation of EPR scheme for the E-waste in the country. The scheme is yet to be fully developed and approved by the government. As was mentioned in an earlier section of this report (please see section 3.1, bullet point e) it is important to keep in mind that any regulation or policy for EPR will become applicable only for the products produced, once the regulation/policy is approved. The possibility of PBDE getting its way in the newly produced electronics products is only in case recycled plastic containing PBDE is used by the manufacturer. Thus, the EPR, once becomes applicable will have very minimal (if at all any) contribution towards addressing the emissions of PBDE. This is more of a 'project design' issue rather than shortcoming in the project implementation.

The results for Component 1/Output 1.1 is unlikely to contribute significantly towards to impacts and the achievement of the project objectives. However, based on the performance of the indicators, the **achievement of results for Component 1/Output 1.1 is rated as Moderately Satisfactory.**

### *5.1.2 Attainment of Results - Component 2/Output 2*

Component 2 of the project was to ensure that PBDE is not used in the production stage of new plastic goods. This component had the following two specific targeted Outputs:

Output 2: Activity Result/Output 2.1: Sufficient national technical expertise built to meet challenges with PBDEs in manufacturing and plastic raw material recycling.

Output 2: Activity Result/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.

Indicative activities that were to be carried out under different Outputs of Component 2 were provided in Section 3.1 (please see Table 8). Table 14 provides details of the achievement of the results for the two Outcomes of Component 2.

**Table 14: Results: Component 2/Output 2: Reducing or eliminating the importation and use of PBDEs in plastics manufacturing**

Indicator	EOP Target	Status at MTR	Status at PIR 2020	Status at TE	TE Rating
<b>Output 2.1</b>		<b>MTR Rating: S</b>			
• <i>Indicator 2.1</i> Number of technical guidelines on plastic production and recycling are developed	• A technical guideline and standard on the plastics production and recycling is established. • 6 associations of plastic manufacturing companies, 3 plastic	• Reports on Training Modules for recyclers • The technical guideline has been prepared by AMC • Training for plastic	• 100% achieved • Technical guidelines having three modules got prepared • 18 plastic manufacturers, 15 recycling industries, 4 plastic manufacturer associations, 5 recycling associations	• Technical guidelines covering improvement in handling, storing, recycling, and disposing of PBDEs containing waste in the plastic recycling sector, BAT/BEP PBDE	S (please see the details provided in the paragraphs following this Table)

Indicator	EOP Target	Status at MTR	Status at PIR 2020	Status at TE	TE Rating
	manufacturing companies, and 4 plastic recycling companies gain information regarding the technical guidelines and standards on the plastic production and recycling.	recycling company delivered. • Both guidelines and training have been developed for recyclers and manufacturers.	and 10 governments have been informed regarding the technical guidelines. These guidelines were used for training purpose as well • Six recycling industries and six plastic manufacturers in East Java and West Java were willing to join the pilot implementation of those guidelines. For pilot training beneficiaries	in recycling sector; use of flame retardant on plastic manufacturers and PBDE identification and selection in raw materials • Training of stakeholders, including trade associations, plastic recyclers	
<b>Output 2.2</b>		<b>MTR Rating: S</b>			
• <i>Indicator 2.2</i> Number of plastic manufacturers have comprehensive raw material checks for PBDEs.	• Six plastic manufacturers gain information on the danger of hazardous and toxic PBDEs and UPOPs through the implementation of workshops in Bekasi, Surabaya and Bandung • Three more selected companies are willing to join the programme to reduce and phase out PBDE in their production processes • Three more selected companies have tools to identify PBDEs	• Guidance document, try out sessions and training delivered; however, the impact is limited as limited changes was observed on the recycling practices.	• The cumulative progress is 90% • The project provided support for a quality assurance programme for PBDE reduction to 10 plastic manufacturers The PBDE reduction program provided was the Quality Assurance (QA) ISO 9001:2015.	• Quality assurance programme for PBDE reduction to 10 plastic manufacturers. • It is not clear how the ISO 9001 will ensure quality checks for PBDE content in the absence of a credible testing method. The project has not provided tools to identify the presence of PBDEs	MS (please see the details provided in the paragraphs following this Table)

### Indicator 2.1

The project has successfully developed the ‘technical guidelines’ covering improvement in handling, storing, recycling, and disposing of PBDEs containing waste in the plastic recycling sector, BAT/BEP PBDE in recycling sector; use of flame retardant on plastic manufacturers and PBDE etc.

### Indicator 2.2

Against this indicator the project provided support for a quality assurance programme for PBDE reduction to 10 plastic manufacturers. The PBDE reduction program provided was the Quality Assurance (QA) ISO 9001:2015. The program ensures that manufacturers use PBDE-free raw materials. The QA program consisted of training, audit, and ISO 9001:2015 certification. It is not clear how ISO 9001 will ensure quality checks for PBDE content in the absence of a credible testing method. The project has not provided tools to identify presence of PBDEs. The activities which were envisaged (as per Project Document) for this indicator included PBDE free labelling etc.

As was mentioned in an earlier section of this report (please see section 3.1, bullet point f), the challenge is how the recyclers/plastic goods manufacturers would identify the PBDE containing plastic waste/recycled plastic. The issue is the availability of an affordable and practical method to identify PBDE containing materials at the level of plastic waste handlers/manufacturers of plastic goods. Although, the project has supported some of the instruments for identifying PBDE containing plastic

waste, there numbers are very limited and given the cost, the possibility of the plastic waste collectors buying them is remote.

The achievement of results for Component 2/Output 2 of the project is rated as Moderately Satisfactory.

### 5.1.3 Attainment of Results – Component 3/Output 3

Component 3 of the project was to work towards pilot approaches to divert PBDE containing plastics already entering the recycling chain as well as reducing the amount of uncontrolled plastic waste burning at recyclers. Component 3 of the project had following two targeted Outputs:

Output 3: Activity Result/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.

Output 3: Activity Result/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 practices at recycling entities.

Indicative activities which were to be carried out under different Outputs of Component 3 were provided in Section 3.1 (please see Table 8). Table 15 provides details of the achievement of the results for the two Outcomes of Component 3.

**Table 15: Results: Component 3/Output 3: Reducing of UPOPs and PDBEs from unsound plastics recycling**

Indicator	EOP Target	Status at MTR	Status at PIR 2020	Status at TE	TE Rating
<b>Output 3.1</b>		<b>MTR Rating: MS</b>			
<ul style="list-style-type: none"> <li><i>Indicator 3.1</i> Gender disaggregated data on recyclers</li> </ul>	<ul style="list-style-type: none"> <li>A gender segregated data on recyclers is collected</li> <li>3 capacity building programs that cover the interest of both women and men workers are undertaken</li> <li>6 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.</li> </ul>	<ul style="list-style-type: none"> <li>Training for recycling company has been delivered.</li> </ul>	<ul style="list-style-type: none"> <li>100% Completed</li> <li>Gender segregated data on recyclers was collected.</li> <li>Developed a gender mainstreaming strategy to strengthen the capacity to prevent harmful impact of hazardous chemical substances exposure.</li> <li>Training module on plastic recycling sector on gender sensitive health and safety protection, and financial literacy was developed and used in capacity building program.</li> <li>Six recycling associations, six governments, 37 recycling industries, 13 NGOs and 3 local organizations involved in four TOTs.</li> </ul>	<ul style="list-style-type: none"> <li>Data base of recyclers</li> <li>Capacity building and training programs conducted for workers (both men and women)</li> </ul>	MS (please see the details provided in the paragraphs following this Table)

Indicator	EOP Target	Status at MTR	Status at PIR 2020	Status at TE	TE Rating
<p><b>Indicator 3.2</b> Number of plastic recyclers whose capacity to identify PBDEs and process plastic waste to BAT/BEP is increased.</p>	<ul style="list-style-type: none"> <li>Six recycling companies are trained to understand the danger of hazardous and toxic PBDEs.</li> <li>6 selected companies have tools to identify PBDEs and dispose PBDEs containing goods</li> </ul>	<ul style="list-style-type: none"> <li>Although the training in selected companies has been performed, the companies are reluctant to implement best environmental practices and health protection measures.</li> </ul>	<ul style="list-style-type: none"> <li>90% Completion</li> <li>Two BAT/BEP training workshops has been conducted in Bekasi and Mojokerto. The training also explained the appropriate means of handling, storing, recycling, and disposing of waste containing PBDEs in the plastic recycling sector.</li> <li>Six plastic recyclers received comprehensive training on raw material checks for PBDEs.</li> <li>The recyclers are willing to join the disposal program for PBDE containing waste in proper way i.e., cement kiln, but the cost of transportation to cement factories appears to exceed the potential income from the sale of materials to the cement factories.</li> </ul>	<ul style="list-style-type: none"> <li>Capacity building of recyclers has been carried out to identify safely dispose of PBDE containing plastic</li> <li>Few equipment to test the plastic for PDBE content has been made available.</li> </ul>	MS (please see the details provided in the paragraphs following this Table)
<p><b>Indicator 3.3</b> Rudimentary techniques for plastic processing applied in plastic recycling clusters</p>	<ul style="list-style-type: none"> <li>A draft of technical guideline (BAT/BEP) for recycling sector is prepared and established</li> <li>The established technical guideline is integrated into 6 plastic recycling practices.</li> </ul>	<ul style="list-style-type: none"> <li>Recyclers are not yet identifying PBDEs and disposing PBDEs containing materials. The technical guideline is not integrated in the plastic recycling practices</li> </ul>	<ul style="list-style-type: none"> <li>90% Completion</li> <li>A technical guideline on BAT/BEP for plastic recycling was developed.</li> <li>The guideline has been implemented in three plastic recycling in East Java and three recycling in West Java.</li> <li>Rudimentary techniques e.g., sink and float method for plastic processing have been applied mostly in the recycling sector in our project sites.</li> </ul>	<ul style="list-style-type: none"> <li>Technical guidelines on BAT/BEP for plastic recycling was developed. The work was completed in Feb 2019</li> <li>Trainings on technical guidelines (including training to use XRF and sink and float method for identification and separation of PBDE containing plastic)</li> </ul>	MS (please see the details provided in the paragraphs following this Table)
<b>Output 3.2</b>		<b>MTR Rating: U</b>			
<p><b>Indicator 3.4</b> Tonnage of PBDE containing plastics separated and</p>	<ul style="list-style-type: none"> <li>1000 metric tons of PBDE containing plastic waste are separated and safely disposed.</li> </ul>	<ul style="list-style-type: none"> <li>No PBDE contaminated plastic has been segregated or disposed of so far.</li> <li>The discussion on the disposal</li> </ul>	<ul style="list-style-type: none"> <li>It is off-track and is estimated to be at 40% progress to completion</li> <li>This target is off-track because the</li> </ul>	<ul style="list-style-type: none"> <li>Companies hired by the project collected and transported PBDEs containing plastics to cement kiln to</li> </ul>	S (please see the details provided in the paragraphs

Indicator	EOP Target	Status at MTR	Status at PIR 2020	Status at TE	TE Rating
safely disposed		technology to be adopted started very recently (April 2019)	proposed program to have recyclers dispose-off waste containing PBDE in a proper way i.e., cement Kiln, has not yet fully taken off. <ul style="list-style-type: none"> <li>The project has initiated discussions with cement factories, and full collaboration will begin after the finalization of the procurement process at UNDP.</li> </ul>	co-fire (as fuel) as a method for safe disposal.	following this Table)
<u>Indicator 3.5</u> Technical guidelines to separate PBDE containing plastics.	<ul style="list-style-type: none"> <li>Technical guidelines to eliminate UPOPs is prepared and established</li> <li>The technical guideline is integrated into 6 plastic recycling practices.</li> </ul>	<ul style="list-style-type: none"> <li>Identification of PBDE containing plastic is an issue, complicated by the fact that the XRF equipment was used only for a small number of samples in the lab.</li> </ul>	<ul style="list-style-type: none"> <li>90% Completion</li> <li>Guidelines for elimination has been developed and are expected to be finalized in August 2019.</li> </ul>	<ul style="list-style-type: none"> <li>For the targets, if seems UPOPs is a typo error and what is meant is PBDE.</li> <li>Technical guidelines have been prepared</li> <li>The guidelines have limited implement ability due to absence of techniques to identify PBDE containing plastic waste in a cost-effective manner</li> </ul>	MS (please see the details provided in the paragraphs following this Table)

### Indicator 3.1& Indicator 3.2

The capacity building and training of the workers has been carried out, however, there is no evidence to suggest that the recyclers are willing to join in the efforts for separation and safe disposal of PBDE containing plastics. After training, the workers know the type of plastic which is suspected of containing PBDE and have tried to practice separating the material, but in daily practice, most of the recyclers use PET bottles or PP as raw materials and not find PBDE containing plastic. One of the issues is the absence of a practical and cost-effective method to determine PBDE content in the plastic. As the equipment to determine PBDE content is costly, it is unlikely that the recyclers would buy and use them at their own. One of the other issues is that for a plastic waste collector/recycler the sale/recycling of the scrap is a mean of livelihood and in the absence of fiscal incentive/compensation, there is no motivation to take the identified PBDE containing plastic scrap to a safe disposal site.

The project has worked on 6 mini depots, and one of the functions of these mini depots is, to separate, and safely dispose of PBDE-contained plastic. Each mini depot has provision for PBDE corner or a special container to separate PBDE-contained wastes/plastics. One mini depot is focusing collecting e-wastes and separates them from other wastes. Each mini depot will have MoU with the Ministry of Industry. This is one of the ways the project envisages, that the separation and safe disposal of PBDE-contained plastic would happen.

### Indicator 3.3, Indicator 3.4, and Indicator 3.5

Techniques to identify PBDE-containing plastics at the level of recyclers could not get introduced largely due to the absence of practical and cost-effective methods to identify PDBE containing plastics. During the mid-term review, the problem of identifying PBDE-contained plastic came up, the MTR suggested the use of XRF to identify materials with Br. A consultant was hired by the project to resolve

this problem. The report by the consultant mentions the following methods to identify and separate PBDE containing plastics; X-ray fluorescence (XRF); sliding spark spectroscopy (SSS), sink & float; and identification by labels and experiences. XRF, SSS and sink & float technologies can only differentiate between Br containing plastic and non-Br containing plastic. XRF and SSS identify PBDE containing plastics based on Br content, whereas the sink & float method uses the likely difference in specific gravity to identify PBDE containing plastic. As variation in specific gravity can be there due to several reasons (e.g., use of fillers), it is not a practical method. Further, the float and sink method is used for separation (and not identification) in the developed world where the material recovery from scrap (automobiles, electronic products etc.) is carried out in automated processes, wherein the entire scrapped article is subjected to the recovery (without manually separating different components).

Based on this recommendation the project provided XRFs to some of the plastic recyclers. The project hired the agencies to collect and transport PBDE containing plastic waste to cement kilns for safe disposal. About 1000 tons of plastic waste (containing Br.) was sent to the cement kilns for safe disposal.

**The achievement of results for Output 3.1 is rated as Moderately Satisfactory. The achievement of results for Output 3.2 is rates as Moderately Satisfactory. The achievement of results for Component 3/Output 3 is rated as Moderately Satisfactory**

#### 5.1.4 Attainment of Results – Component 4/Output 4

Component 4 of the project was to work towards avoiding uncontrolled burning of plastic waste in selected pilot areas for showcasing good approaches for replication. This was to be achieved by creating disposal options for hazardous and unrecyclable plastics waste fractions from both formal and informal recyclers and waste collectors. Component 4 of the project had following targeted Output:

Output 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

Indicative activities which were to be carried out under different Outputs of Component 4 were provided in Section 3.1 (please see Table 8). As can be seen, for PBDE containing plastic waste, there is an overlap between Component 3 (particularly Output 3.2, Indicator 3.4) and Component 4. Table 16 provides details of the achievement of the results for the tow Outcomes of Component 4.

**Table 16: Results: Component 4/Output 4: Reducing releases of UPOPs and PBDEs from unsound plastic disposal practices**

Indicator	EOP Target	Status at MTR	Status at PIR 2020	Status at TE	TE Rating
<b>Output 4.1</b>		<b>MTR Rating: MU</b>			
<ul style="list-style-type: none"> <li><i>Indicator 4.1</i></li> </ul> Number of mini depots for waste separation established at communities	<ul style="list-style-type: none"> <li>6 mini depots are established for waste separation at community</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>Reportedly, difficulties to establish mini depots are associated to the</li> </ul>	<ul style="list-style-type: none"> <li>This activity is off-track and is estimated to be at 50% of progress to completion.</li> <li>One (1) depot located in Cirebon has already been built. The equipment was procured in June 2019 and it is expected that the depot will be fully</li> </ul>	<ul style="list-style-type: none"> <li>The project has successfully supported establishment of following six mini depots; Cirebon, Babakan Village, Cirebon Regency; Bandung, Jl. Cicukang Holis, West Bandung; Malang City, located in Supit Urang Landfill, Malang City;</li> </ul>	S (please see the details provided in the paragraphs following this Table)

Indicator	EOP Target	Status at MTR	Status at PIR 2020	Status at TE	TE Rating
		need to obtain the permit from the local authorities to use the land for waste management disposal.	operational in September 2019. • The development of other depots located in Malang (East Java) and Depok (West Java) is currently underway.	Malang Regency, location in Kepanjen Landfill, Malang Regency; Banyuwangi Regency, located in Kecamatan Muncar, Banyuwangi.	
• <i>Indicator 4.2.</i> Tonnage of waste diverted from river dumping	• 8 tons/week (out of 10 tons/week being dumped in the baseline case) of plastic waste diverted from river dumping in East Java.	<ul style="list-style-type: none"> <li>• No plastic has been diverted from river dumping yet through the mini depots</li> <li>• There is a substantial risk that 8 tons of plastic / week diverted would not be achieved within the project deadline.</li> </ul>	<ul style="list-style-type: none"> <li>• This activity is currently off-track and is estimated to be at 50% of progress to completion.</li> <li>• As the depots are not yet fully functional, there is no waste diverted from river dumping.</li> </ul>	<ul style="list-style-type: none"> <li>• The operations in the mini depots have started towards the end of the project. Thus, the quantum of waste being processed is falling short of the target. However, going forward the targeted level of operation of the mini depots is likely to be achieved</li> </ul>	MS (please see the details provided in the paragraphs following this Table)
• <i>Indicator 4.3</i> Additional tonnage of MSW undergoing sanitary landfilling and waste to energy treatment in Surabaya and Bandung.	• 8 tons/week of plastic waste diverted from river dumping in West Java (In the baseline ,1000 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)	<ul style="list-style-type: none"> <li>• No plastic has been diverted from river dumping yet through the mini depots</li> <li>• There is a substantial risk that 8 tons of plastic / week diverted would not be achieved within the project deadline</li> </ul>	<ul style="list-style-type: none"> <li>• This activity is currently off track and is estimated to be at 50% of progress to completion.</li> <li>• Project has identified some options for the disposal of waste containing PBDE.</li> </ul>	<ul style="list-style-type: none"> <li>• The operations in the mini depots have started towards the end of the project. Thus, the quantum of waste being processed is falling short of the target. However, going forward, the targeted level of operation of the mini depots is likely to be achieved</li> </ul>	MS (please see the details provided in the paragraphs following this Table)

#### Indicator 4.1

The project has successfully supported the establishment of following six mini depots; Cirebon, Babakan Village, Cirebon Regency; Bandung, Jl. Cicukang Holis, West Bandung; Malang City, located in Supit Urang Landfill, Malang City; Malang Regency, location in Kepanjen Landfill, Malang Regency; Banyuwangi Regency, located in Kecamatan Muncar, Banyuwangi

#### Indicator 4.2 and Indicator 4.3

The operations in the mini depots have started towards the end of the project. Thus, the quantum of waste being processed is falling short of the target. However, going forward the targeted level of operation of the mini depots is likely to be achieved

Baring the minor deficiency that the mini depots could become operational only towards the end of the project, the output 4 of the project has been achieved successfully. The **achievement of results for Component 4/Output 4 of the project is rated as Satisfactory.**

### 5.1.5 Attainment of Results - Project Objectives / Global Environmental Benefits

The objective of the project was 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 also aimed at assisting the country in implementing its obligations under the Stockholm Convention to reduce the releases of PBDEs and UPOPs, as well as strengthening the sound management of chemicals and waste in order to protect human health and the environment. The ‘Project Design’ has not provided any indicators at the level of the ‘project Objective’.

The Global Environmental Benefits of the project is the reduction in the emission/release of PBDE and UPOPs. The ‘project document’ has not provided any quantitative targets for the reduction in the emission/release of PBDE and UPOPs. However, the ‘project document’ did provide the targets for the quantum of elimination of the plastic waste containing PBDE, which in turn leads to the reduction in the release of PBDE. The project has also provided the targets for the additional quantum of non-recyclable plastic (which is getting dumped in the rivers) to be disposed of in a safe manner, leading to lesser emission of UPOPs in the disposal process.

The project has not been able to address the objective of reduction in the emission/release of PBDE. The objective of reduction in the emissions of UPOPs has been achieved, however, as the mini depots could start operations only towards the end of the project, the quantitative target for processing/disposal of additional non-recyclable plastic waste has not happened within the project implementation timelines.

One of the other aspects which is important to consider that in the baseline, this additional quantity of plastic waste was being dumped in the river. Although dumping of plastic waste in the river (as being done in the baseline situation) is not desirable from the environmental point of view, such an act does not lead to emission of UPOPs (unless the plastic waste gets incinerated). It is not clear, if in the baseline situation, the additional plastic waste that is getting collected under the project gets incinerated. The baseline situation would have led to the emissions of UPOPs and PBDE (in case of PBDE containing plastics) only if in the baseline situation, this plastic waste would have got burned in one way or the other. If the assumption that in the baseline situation, the additional plastic waste being collected now would have got burned, then there is no contribution by the project towards the reduction in the emission of UPOPs.

**Achievement of Project Objectives/Global Environmental Benefits of the project has been rated as Moderately Satisfactory.**

## 5.2 Relevance

The main questions for the TE were: (please see Annex B for the evaluation questions)

- To what extent is the activity suited to local and national development priorities and organizational policies, including changes over time?
- To what extent is the project in line with UNDP Operational Programs or the strategic priorities under which the project has been funded?

Indonesia ratified the Stockholm Convention on 28 September 2009. Indonesia published its “National Implementation Plan (NIP) on the Elimination and Reduction of POPs” on 29 July 2008. This NIP was for the initial 12 POPs, including Dioxin and Furans and proposed actions with respect to legislation, institutional capacity, and human resources in order to meet Indonesia’s obligations to the Stockholm Convention. The NIP proposed measures to Reduce Releases from Unintentional Production.

Polybrominated Diphenyl Ethers (PBDEs) was one of the “new” nine POPs which were listed in the

2009 amendment of the Stockholm Convention and therefore were not covered in the first NIP. The NIP was updated in 2014 and included PBDE (apart from other POPs newly introduced in the Stockholm Convention). The Government of Indonesia is presently working on another revision of the NIP for SC.

The project is in line with the UNPDF Outcome, “by 2020, Indonesia is sustainably managing its natural resources, on land and at sea with increased resilience to the effects of climate change, disasters and other shocks. The project is also in line with the UNDP Strategic Plan Outcome, ‘Growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihood for the poor and excluded’.

**The relevance of the project has been rated as Relevant.**

### 5.3 Effectiveness & Efficiency

The main questions for the TE were: (please see Annex B for the evaluation questions)

- To what extent the objectives have been achieved?
- To what extent the results have been delivered with the least costly resources possible?
- What are the positive and negative, foreseen and unforeseen changes to, and effects produced by a development intervention?

The project has been able partially achieve most of its objective of reduction in the emissions of UPOPs. When it comes to the project objective of reducing the emissions of PBDE, the project has fallen short on delivery.

The project has led to reduction in the emissions of UPOPs thereby helping Indonesia to meet its obligations under the Stockholm Convention. The project has also led to the formulation of regulations regarding use and disposal practices for the plastic containing PBDE.

There were significant issues with the ‘Project Design’. However, due to the proactive approach of the project implementation team and the able guidance of the Project Board the implementation of the project could be carried out in an effective and timely manner, barring some of the activities/components pertaining to an emission reduction of PBDE.

Though the results have fallen short of expectations, they have been achieved in a cost-effective manner; the **Effectiveness and Efficiency of the project has been rated as ‘Moderately Satisfactory’.**

**Overall Project Outcome has been rated as Moderately Satisfactory.**

### 5.4 Country ownership

The main questions for TE were: (please see Annex B for the evaluation questions)

- Was the project concept in line with development priorities and plans of Indonesia?
- Were the relevant country representatives from government and civil society involved in project implementation, including as part of the project steering committee?
- Was an inter-governmental committee given responsibility to liaise with the project team, recognizing that more than one ministry should be involved?
- Have the government(s), enacted legislation, and/or developed policies and regulations in line with the project’s objectives?

Although, the government in Indonesia has limited resources, the amount of effort towards improving the management of plastic waste in the past demonstrates its commitment towards improving the situation. This is evident from the baseline projects/activities (please see section 3.7) which were implemented by the government in Indonesia.

For the implementation of the project, there was a high level of involvement of the relevant country representatives from government and civil society and they were members of the 'Project Board'. Many important departments and ministries were the implementation partners for the project. The 'Project Board' had members from the relevant ministries and departments of the government.

Some of the partnerships established under the project include the partnership with the Ministry of Environment and Forestry, local government agencies (BAPPEDA) at Mojokerto, the Local office of Environmental Management, Ministry of Industry. The 'Project Board' also acted as the inter-governmental committee with the responsibility to liaise with the project team.

## 5.5 Mainstreaming

The main questions for the TE were: (please see Annex B for the evaluation questions)

- **How is the project successfully mainstreaming other UNDP priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters, and women's empowerment?**
- **Whether it is possible to identify and define positive or negative effects of the project on local populations (e.g., income generation/job creation, improved natural resource management arrangements with local groups, improvement in policy frameworks for resource allocation and distribution, regeneration of natural resources for long term sustainability).**
- **Do the project objectives conform to agreed priorities in the UNDP country programme document (CPD) and country programme action plan (CPAP)?**
- **Whether there is evidence that the project outcomes have contributed to better preparations to cope with natural disasters.**
- **Whether gender issues have been taken into account in project design and implementation and in what way has the project contributed to greater consideration of gender aspects, (i.e., project team composition, gender-related aspects of pollution impacts, stakeholder outreach to women's groups, etc.)**

In Indonesia, UNDP has a long history of supporting the development initiatives. UNDP has been working as one of the key development partners to achieve sustainable human development in economic, social, and environmental fronts. While working with the Government at the national, regional, and local levels, civil society and the private sector, UNDP aims at eradicating extreme poverty, and reducing inequalities and exclusion to protect both people and the planet. The project was fully compliant with UNDP's environmental and social safeguards defined by integration of precautionary principle into programme/project management cycles. The very design of this project correlates to the main objective of safeguarding to prevent and mitigate undue harm to the environment and people at the earliest possible planning stage, and to identify and realize opportunities to strengthen environmental and social sustainability.

The project design and its implementation has taken specific care to ensure women's participation. Considering that majority of the plastic waste collectors are women, improving the practice of collection, sorting and recycling of plastic waste will have a positive impact on women (reduced impact of POPs, heavy metals and PBDE). Overall, given the conditions or opportunities, the project provided women with safety at the workplace through introduction of proper plastic waste management in plastic recycling organizations in the country.

In order to build awareness regarding gender issues in the plastic recycling industry, the project carried out an evaluation for determine the needs of workers, both women and men in a number of locations in Jakarta, Surabaya, Jombang and Mojokerto. This evaluation looked into the aspects of livelihood, financial management and protection against the risks of hazardous chemicals exposure. Gender-disaggregated data collection was carried out as a part of project activities.

Lessons learned about gender roles, risk to PDBEs/UPOPs releases to health and opportunity for livelihood sustainability for both men and women at recycle sectors were also documented. The project did not create any negative impact on women and other vulnerable groups.

The positive impacts created by the project for women (safer working environment, increased income to bring them at par with their male counterparts etc.) will continue as long as there are consistent efforts to maintain the raised level of awareness and participation by women in the decision-making processes.

## 5.6 Sustainability

The main questions for the TE were: (please see Annex B for the evaluation questions)

- Are there financial risks that may jeopardize the sustainability of project outcomes?
- What is the likelihood of financial and economic resources not being available once GEF grant assistance ends?
- Are there social or political risks that may threaten the sustainability of project outcomes?
- What is the risk for instance 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 project benefits continue to flow?
- Is there sufficient public/stakeholder awareness in support of the project's long-term objectives?
- Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits?
- Are requisite systems for accountability and transparency, and required technical knowhow, in place?
- Are there ongoing activities that may pose an environmental threat to the sustainability of project outcomes?

The infrastructure created by the project, for treatment and disposal of the plastic waste by way of mini depots is unlikely to face any issue in terms of availability of funds for operation and maintenance. This is because the plastic material in the waste is recycled, wherein the recycling companies make payments for the plastic collected by them from the waste collection and aggregation. The revenues collected would be sufficient to support the operation of the entire network of collection, treatment, and disposal of the plastic waste. **The sustainability of the project from the viewpoint of financial risks is Moderately Likely (ML).**

The actions by way of training and capacity building, which have been implemented on the ground, have created a positive impact in the health care workers, the government officials, and the communities. However, one of the issues which may be problematic (particularly for the replication of mini depot) is a possible opposition by the residents regarding the location of such mini depot, as waste processing facilities are perceived to be having negative impacts on the neighborhood. **From the viewpoint of Socio-political risk to the sustainability of the impacts, the sustainability has been rated as Likely.**

As such there some institutional and governance risk to the sustainability of the mini depots, as the communities having the responsibility to manage the mini depots may lack the required financial management and administrative skills. **From the viewpoint of institutional framework and governance risks, the sustainability of the project is Moderately Likely.**

There are no negative environmental impacts of the project. **From the viewpoint of environmental risk, sustainability of the project is Likely.**

**The overall sustainability of project results is rated as 'Moderately Likely'.**

## 5.7 Impact

The main questions for the TE were: (please see Annex B for the evaluation questions)

- Whether the project has demonstrated verifiable improvements in ecological status?
- Whether the project has demonstrated verifiable reductions in stress on ecological systems through specified process indicators, that progress is being made towards achievement of stress reduction and/or ecological improvement?

There are issues with the project design, wherein all the Outputs of the project are not supporting the Objectives of the project. This is one of the reasons due to which the results of the project and hence the Impacts of the project have suffered.

The desired impact of the project was the reduction in the emission/release of PBDE and UPOPs to the environment due to plastic waste processing and recycling. The project has not been able to address the reduction in the emission/release of PBDE. The desired impact of the reduction in the emissions of UPOPs has been achieved.

In case of the component of the project pertaining to emissions of PBDE, the project design considered that the ban /restriction on the use/recycling of PBDE/PBDE and environmentally safe disposal of PBDE containing plastic waste would address the emissions of PBDE. However, the project design did not work as cost effective and practical methods to identify PBDE plastic waste were missing. Also, the safe facilities to dispose of PBDE-containing plastics coupled with the lack of motivation/financial incentive on the part of waste collectors prevented safe disposal of PBDE-containing waste.

The substitution of the present methods of disposal of non-recyclable plastic waste in the river streams with environmentally sound methods of disposal, helped achievement of a reduction in the emission of UPOPs.

## 5.8 Cross Cutting Issues

Some of the cross-cutting issues were presented earlier under section 5.5. The other cross cutting issues are being discussed below.

By promoting proper handling of the plastic waste, the project has led to reduction in the risk to the plastic waste collectors and recyclers. The mini depots created under the project has led to an increase in the income levels of the plastic waste collectors and there is a bit of value addition (by way of sorting of different grades, washing and cleaning etc.) before it is supplied to the plastic recycling units. The mini depots have provided employment to the local people.

Avoidance of dumping of the waste plastics into the river streams led to the positive impact on the water streams and the environment. In this regard, it is important to note that management of plastic waste and marine debris (marine debris) is one of the major environmental issues in Indonesia. By facilitating diversion of additional quantities of plastic waste to mini-depots for recycling/safe disposal, the project has contributed to address this problem to some extent. Although, the concept of mini-depots for management of plastic waste is not new in Indonesia, the project has demonstrated how the operations of mini-depots can be self-sustaining, due to realization of comparatively higher money due to value addition (with minimal efforts) at the level of the mini-depots. This will encourage creation of more mini-depots and diversion of more plastic waste for proper recycling or safe disposal, leading to further reduction in the littering of non-recyclable plastic waste and creation of marine debris. The project has contributed to the achievement of country program Output (UNDP CP 2016-2020, Output #3.5).

## 5.9 Catalytic/Replication Effects

Creation and successful operation of the mini depot has been one of the achievements of the project. To impacts and results of the project would increase if case replication of the mini-depots is carried out. A detailed case study of the concept of mini depot, its financial viability, followed by wider dissemination of the case study, would attract investment for the establishment of the more mini depot.

Based on the success of the project to demonstrate management of plastic waste and reduction of the emissions of UPOPs using the concept of segregation of different types of plastic waste by the waste pickers and preliminary processing at the mini depot level, a follow up project may be taken up to

replicate the concept of mini depots (implemented by private sector). Doner funds can be utilized for information dissemination, study tour to the successful mini depots, development of the business model, organizing the workshops for the entrepreneurs to take up establish the mini depots.

### 5.10 Summary of Ratings

Table 17 below provides the summary of the ratings for different evaluation criteria.

**Table 17: Summary of Ratings**

<b>Assessment of Outcome</b>	<b>Rating</b>
Relevance	Relevant
Effectiveness	Moderately Satisfactory
Efficiency	Moderately Satisfactory
Overall Project Outcome Rating	Moderately Satisfactory

## 6. CONCLUSIONS, RECOMMENDATIONS & LESSONS

The main questions for the TE were: (please see Annex B for the evaluation questions)

- Did the project provide cost-effective solutions to address barriers?
- Are these solutions provided in an efficient way?
- What are the best and worst practices in addressing issues relating to relevance, performance, and success?
- 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

### 6.1 Conclusions

Some of the barriers identified at the PPG stage, by the project towards addressing the release of UPOPs and PBDE in Indonesia include absence of regulations; Lack of institutional capacity; Lack of Professional and Technical limitations; lack of expertise and experience in dealing with chemicals and POPs management; lack of technical capacity (such as national laboratories). The project successfully led to reduction in the release of UPOPs by addressing some of these barriers.

The efforts towards reduction in the release of PBDE were not that successful. The practice which did not work in the case of the project was the regulations towards limiting the use of PBDE in the products. This was not a very cost-effective solution, as PBDE is not produced in any part of the world since 2004, thus, the possibility of its use in the products was restricted to the use of old recycled plastic, which possibly may contain PBDE. Although, the project successfully created some of the regulations, the impacts were not significant. For avoidance of the release of PBDE the approach required to be followed should have been aligned to destruction of existing inventory. Destruction of existing inventory is the approach which is typically followed for the POPs (e.g., PCB)

One of the best practices out of the project was the use of the concept of mini-depots for management of plastic waste. This worked well for addressing the emissions of UPOPs, in one of the major sources of such emissions and releases, i.e., disposal of non-recyclable plastic waste. This was achieved by facilitating the collection and aggregation and value addition at mini depots. The plastic waste that is recyclable and has economic value is collected and recycled at its own, if the volumes of waste at a given location are sufficient to justify commercial operations. The non-recyclable plastic waste, which comprises of Multi-layered packaging, thin blown films, small pieces of plastic, don't get collected and is littered. These non-recyclable plastics at times get used as fuel or are burnt as a disposal method. Open burning of non-recyclable plastics is one of the primary sources of dioxins emissions to the atmosphere.

One of the objectives of the project was to demonstrate and promote best practices and techniques for non-recyclable plastic waste which at the same time can reduce the emission of UPOPs and reduce risks to the workers in the plastic waste collection and recycling facilities. The project has partially achieved this objective. The shortcomings were there as an arrangement to dispose of non-recyclable plastic waste in a safe manner (e.g., by co-incineration in a cement kiln) could not be made in a timely manner.

The other objective of the project was to address the emissions/release of PBDE due to recycling and/or disposal of PBDE containing plastic waste. Once again, this was to be achieved by promotion and demonstration of best practices for PBDE containing plastic waste. The PBDE part of the project had limitations due to absence of cost-effective and practical methods for the identification of PBDE containing plastic waste. However, the project successfully overcame this issue by providing Br. Detecting equipment to the recyclers.

To achieve cooperation from the national counterparts in Indonesia, the global environmental objectives of the project were linked with the effectiveness of the waste management in the country. The rationale

of the project was that best practices for waste management leads to improvement in the local environment.

Training and capacity building was one of the major efforts of the project. Training and capacity building were carried out across various stakeholders, ranging from the government officials, waste pickers, recycling industry, trade association, and NGOs.

## 6.2 Lessons learned

Some of the lessons learned that can be applied to future UNDP-supported GEF-financed interventions in the focal area of 'Management of Chemicals and Waste' are as follows;

- f) For the project design, it would help if the indicators like reduction in the emission of POPs have a target value to be achieved, during the implementation of the project and post project implementation.
- g) The project design and implementation missed out on one of the important stakeholders, that is the cement kilns (or other places for safe disposal of plastic waste), where PBDE containing plastic waste and non-recyclable plastic waste can be disposed on in a manner which doesn't lead to emission of PBDE and UPOPs. It is recommended that for the projects directed towards the destruction of POPs, it would help to take on board the stakeholders which would eventually take up the task of safe disposal.
- h) The project design has not provided any incentive (or making good the potential loss) for the plastic waste collector to take/handover any PBDE containing plastic waste for disposal at a designated place for safe disposal of PBDE containing plastic waste. Considering that any plastic waste collected by a waste picker/recycler, is a mean of livelihood for them and their preference would be to sell it to the recycling industry to recover the cost of collection and some earnings. It is recommended that any project designed for the elimination of POPs/POPs containing material, provision is for the cost of collection and safe disposal of the material.
- i) Management of the waste in a given urban area is the responsibility of the Urban Local Body (ULB). To ensure effective implementation of management of waste-related projects, the local governing bodies (ULB/municipal corporation/provincial government/ other local governing bodies) may be included in the administrative set up for implementation of the project. The representative of such local bodies, where the pilot projects/actions are planned may be included in the 'Project Board' as members.
- j) The process of formation of UPOPs and POPs (other than UPOPs) are different. Although, the emissions pathways to the environment may at times be common (e.g., management of waste). The techniques required to address the emissions of UPOPs, and POPs are different. For example, in the case of UPOPs the emphasis is on avoidance of formation, whereas, in the case of POPs the emphasis needs to be on destruction. It is recommended that for the projects that aim to reduce the emission of both POPs and UPOPs, the set of components/outcomes of the project should be separate for POPs and UPOPs

## 6.3 Recommendations

**Table 18: Recommendations Table**

Rec #	TE Recommendation	Entity Responsible	Time frame
<b>A</b>	<b>Category 1: Actions to follow up or reinforce initial benefits from the project</b>		
A.1	Creation and successful operation of the mini depot has been one of the achievements of the project. During the project, the mini depots were supported by the project. To ensure the sustainability of the operations and to facilitate replication, it would help if a proper administrative and business model for the operation and management of the mini depot is prepared and implemented.	UNDP CO National Government	At the earliest or undertaken this as a part of any other ongoing

Rec #	TE Recommendation	Entity Responsible	Time frame
	Proper representation of women in the management structure needs to be ensured. Also, a detailed case study of the concept of mini depot, its financial viability, followed by wider dissemination of the case study, would attract investment for the establishment of the more mini depot.		project for managing waste
<b>B</b>	<b>Category 2: Proposals for future directions underlining main objectives</b>		
B.1	Based on the success of the project to demonstrate management of plastic waste and reduction of the emissions of UPOPs using the concept of segregation of different types of plastic waste by the waste pickers and preliminary processing at the mini depot level, a follow up project may be taken up to replicate the concept of mini depots (implemented by private sector). Doner funds can be utilized for information dissemination, study tour to the successful mini depots, development of the business model, organizing the workshops for the entrepreneurs to take up establish the mini depots.	UNDP CO National Government	At the earliest or undertaken this as a part of any other ongoing project for managing waste
B.2	To increase participation and sustainable community support, it would be beneficial if a component of the younger generation was involved. An example of a best practice can be seen at the Mini Depot in Cirebon, where Karang Taruna was actively engaged and succeeded in garnering full support from the community. The involvement of youth organizational units such as youth organizations and the Scout Movement certainly has great potential to increase support from the wider community.	UNDP CO National Government	At the earliest or undertaken this as a part of any other ongoing project for managing waste
<b>C</b>	<b>Category 3: Best and worst practices in addressing issues relating to relevance and performance</b>		
C.1	To ensure the effectiveness/impacts of the projects relating to elimination/emission reductions of POPs (other than UPOPs), it would help to have a detailed assessment of the baseline line situation regarding the presence of the targeted POPs in the country where the project is going to be implemented. It would also help, if such a baseline assessment considers the status of the targeted POP in the Stockholm Convention and the status of production/use of the POP internationally. It would be useful to include this information in the Project Document, as it would help and provide some guidance to the team implementing the project.	UNDP CO National Government	This may be clubbed with the ongoing work for updating of NIP for SC
C.2	Most of the Mini-Depots created under the project are running successfully. However, in case of one of the depots supported by the project for plastic waste management, the operations of the mini depot and the MSW are carried out by the same organization wherein the administrative set up and the financials are not segregated. Although, the operation of mini depots for plastic waste is financially viable on its own, difficulties are being faced in its operations, as the earnings from the sale of plastic get utilized for the operation of the MSW part of the operations. It is recommended that to ensure sustainability, the operations of mini depots for plastic waste should be kept administratively and financially separate from the MSW management.	UNDP CO National Government	At the earliest, delink the working of Mini-Depot and the management of MSW

## ANNEX A. TERMS OF REFERENCE

### I. BACKGROUND

Project Title:	Reducing Releases of Polybromodiphenyl Ethers (PBDEs) and Unintentional Persistent Organic Pollutants (UPOPs) Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia		
GEF Project ID:	5052		
UNDP Project ID:	00091789		
Country:	Indonesia		
Region:	Asia Pacific		
Focal Area:	Chemicals and waste		
FA Objectives, (OP/SP):	<p>GEF-5 Chemicals Strategy: Objective 1: Phase out POPs and Reduce POPs Releases.</p> <p>Production and use of controlled POPs chemicals phased out. (GEF-5 Outcome 1.1)</p> <p>POPs releases to the environment reduced. (GEF-5 Outcome 1.3)</p> <p>Country capacity built to effectively phase out and reduce releases of POPs (GEF-5 Outcome 1.5)</p>		
Executing Agency:	Ministry of Industry		
Other Partners involved:	N/A	ProDoc Signature (date project began):	16 March 2016
		(Operational) Closing Date:	Proposed: 16 March 2020 Actual: 31 March 2021

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 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

While in this COVID-19 global pandemic situation, as of 22nd July 2020 total cases in Indonesia is 91,751 cases, recovered 50,255 cases, and death 4,459 cases. Indonesia had lockdown (Large-scale social restriction or Pembatasan Sosial Berskala Besar/PSBB) since 10th April 2020 starting in Jakarta Greater Area. Bandung, West Java, started in 22nd April 2020, and East Java in 28th April 2020. During the lockdown, several project activities including: development of Mini Depo building in Depok, development of Mini Depo building in Bandung (both in West Java) and development of Mini Depo equipment in Malang City, and Malang Regency (all in East Java) have been delayed. Initial expectation the work would be done in the end of September 2020, the delay impacted the work and we expect it will be done in the end of December 2020.

### **Terminal Evaluation (TE) Purpose**

The TE report will assess the achievement of project results against what was expected to be achieved, and draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming. The TE report promotes accountability and transparency, and assesses the extent of project accomplishments.

The project was designed 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.

In accordance with UNDP and GEF M&E policies and guidelines, GEF-financed projects are required to undergo a Terminal Evaluation (TE) when implementation has completed. This evaluation must follow detailed guidance outlined in the UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported GEF-financed Projects.

The objectives of the evaluation are to assess the achievement of project results, and to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming.

## **II. SCOPE OF WORK, ACTIVITIES, AND DELIVERABLES**

### **Scope of Work**

The project was designed 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.

In accordance with UNDP and GEF M&E policies and guidelines, GEF-financed projects are required to undergo a Terminal Evaluation (TE) when implementation has completed. This evaluation must follow detailed guidance outlined in the UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported GEF-financed Projects.

The objectives of the evaluation are to assess the achievement of project results, and to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming.

### **Terminal Evaluation Approach and Methodology**

The TE report must provide evidence-based information that is credible, reliable, and useful.

The TE consultant will review all relevant sources of information including documents prepared during the preparation phase (i.e., PIF, UNDP Initiation Plan, UNDP Social and Environmental Screening Procedure/SESP) the Project Document, project reports including annual 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 evaluation. The TE consultant will review the baseline and midterm GEF focal area Core Indicators/Tracking Tools submitted to the GEF at the CEO endorsement and midterm stages and the terminal Core Indicators/Tracking Tools that must be completed before the TE field mission begins.

The TE consultant is expected to follow a participatory and consultative approach ensuring close engagement with the Project Team, government counterparts (the GEF Operational Focal Point), Implementing Partners, the UNDP Country Office(s), the Regional Technical Advisor, direct beneficiaries, and other stakeholders.

Engagement of stakeholders is vital to a successful TE. Stakeholder involvement should include interviews with stakeholders who have project responsibilities, including but not limited to UNDP Indonesia Country Office, Ministry of Industry, GEF Operational Focal Point, Ministry of National Planning and Development, Ministry of Environment and Forestry, Indonesian Institute of Sciences, Downstream Plastic Industry Association of Indonesia (APHINDO); executing agencies, senior officials and task team/component leaders, key experts and consultants in the subject area, Project Board, project beneficiaries, academia, local government and CSOs, etc. Additionally, the TE consultant is expected to conduct field missions to Jakarta, Indonesia, including the following project sites in Cirebon, Depok, Bandung, and Malang.

If it is not possible to travel to or within the country for the TE mission then the TE consultant should develop a methodology that takes this into account the conduct of the TE virtually and remotely, including the use of remote interview methods and extended desk reviews, data analysis, surveys, and evaluation questionnaires. This should be detailed in the TE Inception Report and agreed with the Commissioning Unit.

If all or part of the TE is to be carried out virtually then consideration should be taken for stakeholder availability, ability, or willingness to be interviewed remotely. In addition, their accessibility to the internet/computer may be an issue as many government and national counterparts may be working from home. These limitations must be reflected in the final TE report.

If a data collection/field mission is not possible then remote interviews may be undertaken through telephone or online (skype, zoom etc.). No stakeholders, consultants or UNDP staff should be put in harm's way and safety is the key priority.

A short validation mission may be considered if it is confirmed to be safe for staff, consultants, stakeholders and if such a mission is possible within the TE schedule. Equally, qualified, and independent national consultants can be hired to undertake the TE and interviews in country as long as it is safe to do so.

The specific design and methodology for the TE should emerge from consultations between the TE consultant and the above-mentioned parties regarding what is appropriate and feasible for meeting the TE purpose and objectives and answering the evaluation questions, given limitations of budget, time and data. The TE consultant must, however, use gender-responsive methodologies and tools and ensure that gender equality and women's empowerment, as well as other cross-cutting issues and SDGs are incorporated into the TE report.

The final methodological approach including interview schedule, field visits and data to be used in the evaluation must be clearly outlined in the TE Inception Report and be fully discussed and agreed between UNDP, stakeholders and the TE consultant.

The final report must describe the full TE approach taken and the rationale for the approach making explicit the underlying assumptions, challenges, strengths and weaknesses about the methods and approach of the evaluation.

### Expected Outputs and deliverables

Deliverables/ Outputs	Estimated number of working days	Review and Approvals Required <i>(Indicate designation of person who will review output and confirm acceptance)</i>
1st Deliverable: Inception report on evaluation method	5 working days	Project Management and UNDPCO
2nd Deliverable: Initial findings and 1st draft of final report	10 working days	UNDP-CO, RTA, PCU, GEF OFPs
3rd Deliverable: Final report of Terminal Evaluation approved by UNDP-CO and UNDP-RTA	10 working days	UNDP-CO, RTA, PCU, GEF OFPs

### Payment Schedule

- 20% payment upon satisfactory delivery of the final TE Inception Report and approval by the Commissioning Unit
- 40% payment upon satisfactory delivery of the draft TE report to the Commissioning Unit
- 40% payment upon satisfactory delivery of the final TE report and approval by the Commissioning Unit and RTA (via signatures on the TE Report Clearance Form) and delivery of completed TE Audit Trail

### Criteria for issuing the final payment of 40%

- The final TE report includes all requirements outlined in the TE TOR and is in accordance with the TE guidance.
- The final TE report is clearly written, logically organized, and is specific for this project (i.e., text has not been cut & pasted from other TE reports).
- The Audit Trail includes responses to and justification for each comment listed.

In line with the UNDP's financial regulations, when determined by the Commissioning Unit and/or the consultant that a deliverable or service cannot be satisfactorily completed due to the impact of COVID-19 and limitations to the TE, that deliverable or service will not be paid.

Due to the current COVID-19 situation and its implications, a partial payment may be considered if the consultant invested time towards the deliverable but was unable to complete to circumstances beyond his/her control.

### III. WORKING ARRANGEMENTS

#### Institutional Arrangement

The principal responsibility for managing this evaluation resides with the UNDP CO in Indonesia. The UNDP CO will contract the evaluators and ensure the timely provision of per diems and travel arrangements within the country for the evaluation team. The Project Team will be responsible for liaising with the Evaluators team to set up stakeholder interviews, arrange field visits, coordinate with the Government etc.

#### Duration of the Work

The total duration of the evaluation will be 25 days. TE duration is flexible recognizing there will be possible delay due to COVID-19. The tentative duration is according to the following plan:

Activity	Timing	Completion Date
Preparation	3 days (recommended: 2-4)	16 December 2020
Evaluation Mission	10 days (r: 7-15)	31 December 2020
Draft Evaluation Report	10 days (r: 5-10)	15 January 2021
Final Report	2 days (r: 1-2)	19 January 2021

### Duty Station

Terminal Evaluation Consultant will work with home-based. Consultant will be needed to come to Jakarta, Indonesia, to conduct evaluation arrangement meeting with PMU and UNDP CO. Consultant is also expected to do site visit for evaluation to Cirebon, Depok, Bandung, and Malang.

### Travel Plan

Below is an indicative travel plan for the duration of the assignment. The Consultant will be required to travel to the below indicated destinations and include the relevant costs into the proposal. There may be also unforeseen travel that will come up during the execution of the contract which will be agreed on ad-hoc basis.

No	Destination	Frequency	Duration/days
1	Jakarta	1 time	7 days
2	Cirebon	1 time	2 days
3	Bandungs	1 time	2 days
4	Malang	1 time	3 days

## IV. REQUIREMENTS FOR EXPERIENCE AND QUALIFICATIONS

### Academic Qualifications:

Master's degree in Environmental Science/Engineering, Chemical Science/Engineering or other relevant field

### Years of experience:

1. Minimum 15 years of relevant experience in the areas of environment, solid (plastic) waste management and project management including experience on project monitoring and evaluation and 7 years including experience applying SMART indicators and reconstructing or validating baseline scenarios
2. Recent experience with result-based management evaluation methodologies
3. Experience working with GEF or GEF Evaluations, for at least 5 years
4. Experience in working in Asia Pacific Countries for at least 3 years

### Competencies and special skills requirement:

1. Competence in adaptive management especially on hazardous chemicals or Persistent Organic Pollutants (POPs)
2. Demonstrated understanding on issues related to gender and hazardous chemicals, including experience in gender sensitive evaluation and analysis
3. Excellent communication skills

4. Demonstrable analytical skills
5. Project evaluation/review experiences within the United Nations system will be considered an asset
6. Fluency in English with excellent written communication skills, and strong experience writing reports.
7. Fluency in Bahasa Indonesia would be an advantage but not mandatory

#### V. EVALUATION METHOD AND CRITERIA

Individual consultants will be evaluated based on the following methodologies:

##### Cumulative analysis

When using this weighted scoring method, the award of the contract should be made to the individual consultant whose offer has been evaluated and determined as:

- a) responsive/compliant/acceptable, and
- b) Having received the highest score out of a pre-determined set of weighted technical and financial criteria specific to the solicitation.

\* Technical Criteria weight; [70%]

\* Financial Criteria weight; [30%]

Only candidates obtaining a minimum of 70 point would be considered for the Financial Evaluation

Criteria	Weight	Maximum Point
<u>Technical</u>		
Criteria A: qualification requirements as per TOR:	70%	
1. Master's degree in Environmental Science/Engineering, Chemical Science/Engineering or other relevant field		20
2. Minimum 15 years of relevant experience in the areas of environment, solid (plastic) waste management and project management including experience on project monitoring and evaluation and 7 years including experience applying SMART indicators and reconstructing or validating baseline scenarios		20
3. Recent experience with result-based management evaluation methodologies		20
4. Experience working with GEF or GEF Evaluations, for at least 5 years		5
5. Experience in working in Asia Pacific Countries for at least 3 years		5
☐ Criteria B: Brief Description of Approach to Assignment	30%	
• Detailed understanding of Indonesian Environmental and social standards;		15
• Detailed understanding of International environmental and social standards.		15
☐ Criteria C: Further Assessment by Interview (if any)		

## ANNEX B. TERMINAL EVALUATION CRITERIA AND QUESTIONS

<b>Contents</b>	<b>Main questions and Terminal Evaluation Scope</b>
<p><b>3. Findings: Project design and formulation</b></p> <p>3.1 Analysis of LFA/Results Framework</p> <p>3.2 Assumptions and Risks</p> <p>3.3 Lessons from other relevant projects</p> <p>3.4 Planned stakeholder participation</p> <p>3.5 Replication approach</p> <p>3.6 UNDP comparative advantage</p> <p>3.7 Linkages between project and other interventions within the sector</p> <p>3.8 Management arrangements</p>	<ul style="list-style-type: none"> <li>• Were the project's objectives and components clear, practicable and feasible within its time frame?</li> <li>• Were the capacities of the executing institution(s) and its counterparts properly considered when the project was designed?</li> <li>• Were lessons from other relevant projects properly incorporated in the project design?</li> <li>• Were the partnership arrangements properly identified and roles and responsibilities negotiated prior to project approval?</li> <li>• Were counterpart resources (funding, staff, and facilities), enabling legislation, and adequate project management arrangements in place at project entry?</li> <li>• Were the project assumptions and risks well-articulated in the PIF and project document?</li> <li>• Whether the planned outcomes were "SMART"?</li> </ul>
<p><b>4. Findings: Project Implementation</b></p> <p>4.1 Adaptive management</p> <p>4.2 Partnership arrangements</p> <p>4.3 Feedback from M&amp;E activities used for adaptive management</p> <p>4.4 Project Finance</p> <p>4.5 Monitoring and evaluation: design at entry</p> <p>4.6 Monitoring and evaluation</p>	<p><u><b>ADAPTIVE MANAGEMENT</b></u></p> <ul style="list-style-type: none"> <li>• Did the project undergo significant changes as a result of recommendations from the mid-term review? Or as a result of other review procedures? Explain the process and implications.</li> <li>• If the changes were extensive, did they materially change the expected project outcomes?</li> <li>• Were the project changes articulated in writing and then considered and approved by the project steering committee?</li> </ul> <p><u><b>PARTNERSHIP ARRANGEMENT</b></u></p> <ul style="list-style-type: none"> <li>• Were there adequate provisions in the project design for consultation with stakeholder.</li> <li>• Whether effective partnerships arrangements were established for implementation of the project with relevant stakeholders involved in the country/region, including the formation of a Project Board?</li> <li>• Whether lessons from other relevant projects incorporated into project implementation?</li> <li>• Whether feedback from M&amp;E activities was used for adaptive management?</li> </ul> <p><u><b>PROJECT FINANCE / CO-FINANCE</b></u></p> <ul style="list-style-type: none"> <li>• Whether there was sufficient clarity in the reported co-financing to substantiate in-kind and cash co-financing from all listed sources.</li> <li>• What are the reasons for differences in the level of expected and actual co-financing?</li> <li>• To what extent project components supported by external funders were well integrated into the overall project?</li> <li>• What is the effect on project outcomes and/or sustainability from the extent of materialization of co-financing?</li> <li>• Whether there is evidence of additional, leveraged resources that have been committed as a result of the project?</li> </ul> <p><u><b>PROJECT MONITORING &amp; EVALUATION (AT DESIGN AND AT IMPLEMENTATION)</b></u></p> <ul style="list-style-type: none"> <li>• Is the M&amp;E plan well-conceived at the design stage?</li> <li>• Is M&amp;E plan articulated sufficient to monitor results and track progress toward achieving objectives?</li> <li>• Was the M&amp;E plan sufficiently budgeted and funded during project</li> </ul>

Contents	Main questions and Terminal Evaluation Scope
<p>implementation</p> <p>4.7 UNDP and Implementing Partner implementation / execution coordination, and operational issues</p>	<p>preparation and implementation?</p> <ul style="list-style-type: none"> <li>• How effective are the monitoring indicators from the project document for measuring progress and performance;</li> <li>• Whether the logical framework was used during implementation as a management and M&amp;E tool?</li> <li>• What has been the level of compliance with the progress and financial reporting requirements/ schedule, including quality and timeliness of reports;</li> <li>• What has been effectiveness of the monitoring reports and evidence that these were discussed with stakeholders and project staff;</li> <li>• What is the extent to which follow-up actions, and/ or adaptive management, were taken in response to monitoring reports (APR/PIRs);</li> <li>• Whether APR/PIR self-evaluation ratings were consistent with the MTR and TE findings. If not, were these discrepancies identified by the project steering committee and addressed?</li> <li>• Whether changes were made to project implementation as a result of the MTR recommendations.</li> </ul> <p><b><u>GEF IMPLEMENTING AGENCY EXECUTION - UNDP</u></b></p> <ul style="list-style-type: none"> <li>• Whether there was an appropriate focus on results</li> <li>• Was there adequate UNDP support to the Implementing Partner and project team</li> <li>• Quality and timeliness of technical support to the Implementing Partner and project team</li> <li>• Were the management inputs and processes, including budgeting and procurement adequate</li> </ul>
<p><b>5. Findings: Project Results</b></p> <p>5.1 Overall results</p> <p>5.2 Relevance</p> <p>5.3 Effectiveness &amp; Efficiency</p> <p>5.4 Country ownership</p>	<p><b><u>OVERALL RESULTS</u></b></p> <ul style="list-style-type: none"> <li>• What if the Review the achievement of the objectives against the end of the project values of the log-frame indicators with \indicators for outcomes, indicating baseline situation and target levels, as well as position at the close of the project?</li> </ul> <p><b><u>RELEVANCE</u></b></p> <ul style="list-style-type: none"> <li>• To what extent the activity is suited to local and national development priorities and organizational policies, including changes over time.?</li> <li>• To what extent the project is in line with UNDP Operational Programs or the strategic priorities under which the project was funded?</li> </ul> <p><b><u>EFFECTIVENESS</u></b></p> <ul style="list-style-type: none"> <li>• To what extent the objectives has been achieved?</li> </ul> <p><b><u>EFFICIENCY</u></b></p> <ul style="list-style-type: none"> <li>• To what extent the results have been delivered with the least costly resources possible?</li> <li>• What are the positive and negative, foreseen and unforeseen changes to and effects produced by a development intervention?</li> </ul> <p><b><u>COUNTRY OWNERSHIP</u></b></p> <ul style="list-style-type: none"> <li>• Was the project concept in line with development priorities and plans of the country?</li> <li>• Were the relevant country representatives from government and civil society involved in project implementation, including as part of the project steering committee?</li> <li>• Was an intergovernmental committee given responsibility to liaise with the project team, recognizing that more than one ministry should be involved?</li> <li>• Have the government(s), enacted legislation, and/or developed policies and regulations in line with the project's objectives?</li> </ul>



<b>Contents</b>	<b>Main questions and Terminal Evaluation Scope</b>
<p>6.1 Corrective actions for the design, implementation, monitoring and evaluation of the project</p> <p>6.2 Actions to follow up or reinforce initial benefits from the project</p> <p>6.3 Proposals for future directions underlining main objectives</p> <p>6.4 Best and worst practices in addressing issues relating to relevance, performance, and success</p>	<ul style="list-style-type: none"> <li>• What are the best and worst practices in addressing issues relating to relevance, performance, and success?</li> </ul> <p><b><u>RECOMENDATIONS</u></b></p> <ul style="list-style-type: none"> <li>• Corrective actions for the design, implementation, monitoring and evaluation of the project</li> <li>• Actions to follow up or reinforce initial benefits from the project</li> <li>• Proposals for future directions underlining main objectives</li> </ul>

## ANNEX C. DOCUMENTS REVIEWED

Project Design	
	Project Document
	Project PIF
	CEO Endorsement Letter
	Project Inception Report
	End of Project Report
	PBDE UPOP Project Management Guidelines
	Implementing Partner Agreement
	GEF PBDE UPOP Tracking Tool Project Design
Mid Term Review (MTR)	
	MTR Report
	Management Response to MTR
	GEF Tracking Tool Mid Term
	Audit Trail for Mid Term Review Report
Other Monitoring Documents	
	Budget Vs Expenditures by Outcomes (As Of 31 December 2020): Prepared by Project Team
	CDP Indonesia 2016-2020
	Beneficiaries Tracking Sheet
	Communication Material
Work Plans	
	Annual Work Plan 2017
	Annual Work Plan 2018
	Annual Work Plan 2019
	Annual Work Plan 2020
	Annual Work Plan 2021
	ATLAS Multiyear Annual Workplan-Revision 2017
	Annual Multiyear Annual Workplan Complete 2016-2021
Project Implementation Report (PIR)	
	PIR 2016
	PIR 2017
	PIR 2018
	PIR 2019
	PIR 2020
Project Board Meeting Report	
	Project Board Meeting Report 2017
	Project Board Meeting Report 2018
	Project Board Meeting Report 2019
Combined Delivery Reports (CDR)	
	Combined Delivery Report 2016 (January-December)
	Combined Delivery Report 2017 (July-September)
	Combined Delivery Report 2017 (January-June)
	Combined Delivery Report 2017 (October-December)

	Combined Delivery Report 2018 (January-December)
	Combined Delivery Report 2019 (January-December)
Quarterly Reports	
	Quarterly Monitoring Report 2016 Q1
	Quarterly Monitoring Report 2016 Q2
	Quarterly Monitoring Report 2016 Q3
	Quarterly Monitoring Report 2016 Q4
	Quarterly Monitoring Report 2017 Q1
	Quarterly Monitoring Report 2017 Q2
	Quarterly Monitoring Report 2017 Q3
	Quarterly Monitoring Report 2017 Q4
	Quarterly Monitoring Report 2018 Q1
	Quarterly Monitoring Report 2018 Q2
	Quarterly Monitoring Report 2018 Q3
	Quarterly Monitoring Report 2018 Q4
	Quarterly Monitoring Report 2019 Q1
Project Assurance Reports	
	Project Assurance Report 2019 (January-June)
	Project Assurance Report 2019 (January-December)
	Project Assurance Report 2020 (January-June)
	Project Assurance Report 2020 (January-December)
Technical Reports / Consultancy Reports	
	Final Report Study of Regulatory Development for The Control and Control Of PBDE Flames In The Industrial Sector
	Report on Study Results and analysis of the Regulatory Framework for solid waste management containing PBDE
	The report on the Regulatory Framework for solid waste management containing PBDE
	Proceeding of International Seminar: Electronic Industrial Waste Management and Waste as Industrial Resources to Support Reducing Releases of PBDEs/UPOPs
	Report on Reduction of Polybromodiphenyl Ethers (PBDEs) And Unintentional Persistent Organic Pollutants (UPOPs) From Production, Recycling and Plastic Waste Management Processes in Indonesia
	Details of Support and Projects Carried Out by UPOP PBDE
	List of Beneficiaries (Participants of Workshops, Consultation, Assessment/Survey, Etc., held by UNDP and Relevant Parties)
	Procurement Agreements
	Report of the construction of the Mini Depot in Depok
	Report of the construction of the Mini Depot in Bandung
	Preliminary Report on Planning of Mini-Depo, E-Waste Recycling Center
	Planning Proposals Mini Depo Tawang Sari Tawang Sari Village - Kec. Trowulan - Kab. Mojokerto
Knowledge and legislation products	
	Reports Regarding Livelihood Aspects of Plastic Waste Recycling and Electronic Waste Recycling Workers in Several Cities in East Java and West Java (Gender Analysis of the Plastic Recycling and Electronic Waste Sector Containing Hazardous Chemicals)
	Report on Study of E-Waste as a Tool of Circular Economy
	Video on Women on Plastic Sector
	Video on Project Learning
	Report on Gender and Livelihoods in Babakan Ciwaringin Village, Cirebon Regency

	Final Report EPR Approach in Reducing the Spread of PBDE In E-Waste Extended Producer Responsibility (EPR) Electronic-Electrical Waste (EEW)
	Video on Women on Plastic Sector
	Presentation on Electronic Waste Policy and Technologies in Taiwan
Other Documents - External to the project	
	National Implementation Plan on Elimination and Reduction of Persistent Organic Pollutants in Indonesia - July 2008
	Radically Reducing Plastic Pollution in Indonesia: A Multi stakeholder Action Plan National Plastic Action Partnership - April 2020 – World Economic Forum
	Guidance on best available techniques and best environmental practices for the recycling and disposal of articles containing polybrominated diphenyl ethers (PBDEs) listed under the Stockholm Convention on Persistent Organic Pollutants July 2012 - UNEP
	BAT/BEP Guidance for the recycling and disposal of wastes containing PBDEs listed under the Stockholm Convention on POPs Undated Jan 2017 UNEP
	Understanding PBDE - Subregional workshop on guidance for updating national implementation plans to address the persistent organic pollutants listed in 2009 and 2011, (CSIR-NEERI, 18-20 June 2012 Nagpur, India)
	Global Historical Stocks and Emissions of PBDEs: Golnoush Abbasi, Li, and Knut Breivik, Environmental Science and Technology, 2019
	Indonesia Marine Debris Hotspot - Rapid Assessment Synthesis Report - April 2018, World Bank Group

## ANNEX D: PERSONS INTERVIEWED, MISSION AGENDA

### List of Persons Interviewed

<b>GEF OFP – Ministry of Environment and Forestry</b>			
	1.	Ms. Laksmi Dhewanthi	Senior Advisor to the Minister on Industry and International Trade, Ministry of Environment and Forestry / GEF Operational Focal Point
<b>BAPPENAS (Ministry of National Development Planning)</b>			
	2.	Ms Rd. Siliwanti, MPIA, PhD	Director for Multilateral External Funding
	3.	Mr Leonardo Adypurnama Alias Teguh Sambodo, SP., MS., Ph.D.	Director for Industry, Tourism and Creative Economy
	4.	Ms. Dory Widyanasari	Staff of the Directorate of Multilateral External Funding
	5.	Mr. Muhammad Fadhi	Staff of the Directorate of Multilateral External Funding
	6.	Ms. Rizki Bagastari	Staff of the Directorate of Multilateral External Funding
	7.	Ms. Wiwien Apriani	Staff of the Directorate of Multilateral External Funding
<b>Ministry of Finance</b>			
	8.	Mr. Muhamad Yusuf, S.E., MPP.	Head of Section for Loan and Multilateral Grants C
<b>Ministry of Environment and Forestry</b>			
	9.	Ms. Yun Insiani, M.Sc.	Director of Management of Toxic Hazardous Materials, Ministry of Environment and Forestry
<b>Ministry of Industry</b>			
	10.	Mr. Junadi Marki, ST., MT.	Director of Center for Green Industry
	11.	Mr. Yang Yang Setiawan	Secretary to the Project Board
	12.	Mr. Eko Priyo	Staff of Ministry of Industry.
<b>UNDP</b>			
	13.	Mr. Anderson Alves	Regional Technical Advisor, BRH
	14.	Dr. Agus Prabowo	Senior Management Advisor for the Environment/Head of Environment Unit, UNDP Indonesia
	15.	Mr. Jatupon Thongying (Jack)	Programme Assistant. BRH
	16.	Mr. Kurnia Hanafiah	National Project Manager of PBDE & UPOPs Project (retired in March 2020).
	17.	Mr Anton Sriprobiantono	Senior Program Manager UNDP
<b>Office of Environment and City Cleanliness, Depok, West Java</b>			
	18.	Ms. Ety Suryahati	Head of Environment and City Cleanliness, Depok City, West Java
<b>Office of Industry and Trade of Cirebon Regency</b>			
	19.	Ms. Endang SP	Office of Industry and Trade in Cirebon Regency.
<b>Office of City Cleanliness, Bandung, West Java</b>			
	20.	Mr. Iwan Setiawan	Director of Technical and Operational
	21.	Ms. Euis Juliaha	Head of Special Service Division
<b>Office of Environment, Malang City, East Java</b>			
	22.	Mr. Renung Rubiyantadji	Head of Waste and Hazardous Waste Management Division
<b>Babakan Village, Cirebon Regency, West Java</b>			
	23.	Mr. Satori	Head of Babakan Village
	24.	Mr. KH. Syaifullah Amin (KH. Asep)	Administrator of Mini Depot
<b>Mojokerto Regency, East Java</b>			
	25.	Ms. Nurul Latifah	<i>Recycling Business Entrepreneur</i>
<b>Others Related Stakeholders</b>			
	26.	Mr. Anton Irawan	Academician, University of Sultan Ageung Tirtayasa (UNTIRTA), Banten.
	27.	Mr. Fransiscus Yunus	Academician, University of Surabaya (UBAYA).
	28.	Ms. Karlina Bone	TUV NORD, Developing free-PBDE management system in plastic manufacturer.

29.	Dr. Ir. Putu Sutrisna, M.eng	PT Cagar Bentara Sakti Developing technical guidance on how to detect PBDE for manufacturers and recyclers.
30.	Ms. Made Santihayu Sukma,	PT Cagar Bentara Sakti
31.	Mr Aji Setyawan	PT Cagar Bentara Sakti
32.	Ms. Yasmin	Lohjinawi, Surabaya
33.	Ms. Gita	Bank Sampah Mandiri, Paragita
34.	Mr. Albert	Waste4Change training on waste management to personnel of mini depot in Cirebon.
35.	Mr. Sudirman	Coordinated Temporary Dump Site Reduce Reuse Recycle, Muncar, Banyuwangi, East Java
36.	Mr. Haendry Chavelier	Secretary General of Asociation of Plastic Downstream Industry in Indonesia (APHIND)
37.	Ms. Chatarina Indirastuti,	Social and Gender Independent Consultant

### Mission Schedule

No	Date	Time	Person Meet
1	Monday, December 21, 2020	09:00-10:00 AM Jakarta time	BRH UNDP Regional Office: 1. Mr. Anderson Alves 2. Mr. Jatuphon Thongying (Jack)
		10:00-10:30 AM Jakarta time	Project Management Unit : Mr. Kurnia Hanafiah Former Project Manager PBDE/UPOP
		2:00 – 2:30 PM Jakarta time	Ministry of Finance: Mr. Muhamad Yusuf, S.E., MPP,
2	Tuesday, December 22, 2020	2:00-2:30 PM Jakarta time	GEF Focal Point in Indonesia Ms. Laksmi Dhewanti
3	Wednesday, December 23, 2020	7:30-8:00 AM Jakarta time	Head of Environment Unit UNDP Dr Agus Prabowo
		09:00-10:00 AM Jakarta time	Academician 1. Mr. Anton Irawan, University of Sultan Ageung Tirtayasa (UNTIRTA), Banten. 2. Mr. Fransiscus Yunus, University of Surabaya (UBAYA).
		10:00-11:00 AM Jakarta time	Cirebon Area Stakeholder 1. Mr Saechu, Babakan Village Development Agency 2. Mr Asep, Mini Depot Leader in Babakan
		1:00 – 2:00 PM Jakarta time	Consultant and Civil Society 1. Mr. Albert, Waste for Change 2. Ms Gita, PARAGITA Waste movement 3. Ms Yasmin, Lohjinawi NGO
4	Thursday, December 24, 2020	09:00-10:00 AM Jakarta Time	Banyuwangi Region Stakeholder Mr Sudirman, Banyuwangi Recycling Centre
		10:00-11:00 AM Jakarta Time	UNDP Indonesia Country Office Mr. Anton Sriprobiantono, Senior Program Manager, UNDP
5	Monday, January 4, 2021	10:00-11:00 AM Jakarta Time	Regional Stakeholders 1. Mr.Iwan Kurniawan, Director of Technical and Operational; 2. Ms.Euis Julacha, Special Division Head, City of Office Cleanliness Bandung City 3. Mr Renung, Malang Regency Environmental Agency 4. Ms Endang, Office of Industry City of Cirebon
		3:00-4:00 PM Jakarta time	Ministry of National Development Planning (Bappenas Mr. Leonardo Adypurnama Alias Teguh Sambodo, SP., MS., Ph.D., Director for Industry, Tourism and Creative Economy
		09:00-10:00 AM Jakarta time	Regional Stakeholder Ms. Ety Suryahati,
6	Tuesday, January 5, 2021	09:00-10:00 AM Jakarta time	Regional Stakeholder Ms. Ety Suryahati,

No	Date	Time	Person Meet
			Head of Environment and City Cleanliness, Depok City, West Java
7	Wednesday, January 6, 2021	09:00-10:00 AM Jakarta time	Regional Stakeholder Mr. Budi Heriyanto, Head of Waste Management Division, Office of Environment Malang city
8	Thursday, January 7, 2021	09:00-10:00 AM Jakarta time	Ministry of Industry Mr. Yang Yang Setiawan, Secretary to Project Board
		10:00 – 11:00 AM Jakarta time	Ministry of Industry Mr Eko Priyo
		11:00 AM -12:30 PM Jakarta time	Ministry of Industry Mr. Junadi Marki, ST., MT. Director of Center for Green Industry
		04:00-05:00 PM Jakarta time	Consultant 1. Ms. Made Santihayu Sukma 2. Mr. I Putu Sutrisna 3. Mr. Aji Setyawan PT Cagar Bentara Sakti Engineering
9	Friday, January 8 2021	09:00-10:00 AM Jakarta time	Ministry of Development Planning (BAPPENAS) 1. Dr. Rd. Siliwanti, MPIA (Mrs) Director for Multilateral External Funding 2. Ms. Dory Widyanasari, Staff of the Directorate of Multilateral External Funding 3. Mr. Muhammad Fadhi, Staff of the Directorate of Multilateral External Funding 4. Ms. Rizki Bagastari, Staff of the Directorate of Multilateral External Funding 5. Ms. Wiwien Apriani, Staff of the Directorate of Multilateral External Funding
		2:00-3:00 PM Jakarta time	Ministry of Environment and Forestry (MoEF) Ir. Yun Insiani, M.Sc. (Mrs) Director of Management of Toxic Hazardous Materials, MoEF
10	Tuesday, January 12, 2021	09:00-10:00 AM Jakarta time	Stakeholders Consultation 1. Haendry Chavelier, Secretary General of Association of Plastic Downstream Industry in Indonesia (APHIND) 2. Nurul Latifah, Entrepreneur in Recycling Industry 3. Chatarina Indirastuti, Social and Gender Independent Consultant 4. Karlina Bone, TUV NORD

## ANNEX E: MINUTES OF THE MEETING FROM INTERVIEWS

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Monday December 21, 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> <ol style="list-style-type: none"> <li>1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b></li> <li>2. <b>UNDP Regional Office: Mr. Anderson Alves; Jatupon Thongying (Jack)- BRH UNDP (09.00-10.00) Jakarta time</b></li> <li>3. <b>Mr. Kurnia Hanafiah Former Project Manager PBDE/UPOP (10.00-10.30) Jakarta time</b></li> <li>4. <b>Muhamad Yusuf, S.E., MPP, Ministry of Finance (14.00-14.30) Jakarta Time</b></li> </ol>	
Agenda Item	Key Points
<b>Consultation with UNDP Regional Office (Mr. Anderson and Jack)</b>	<ul style="list-style-type: none"> <li>• Mr. Anderson joined this activity in the final phase of the activity, previously there were 2 people who had supervised the UPOP PBDE activities.</li> <li>• When Anderson joined in February, one of the biggest obstacles, according to him, was the procurement process for the procurement of mini depots which took a while, especially with the obstacles created by COVID-19, hampering the delivery of the Project. However, what is more important is the safety of the staff involved in this Project. There is also the problem of government land use which takes a lot of time in the licensing process which includes government at the national to regional levels.</li> <li>• Regarding other obstacles, Mr. Anderson sees no other major obstacles. although, for example, the NPM (Kurnia Hanafiah) retired at the end of the Project but was replaced by a very competent figure in managing the remaining project time (Tonny). Stakeholders are also highly rated for their ownership of this Project.</li> <li>• If anything could be improved, Anderson would suggest a project period of six years instead of five. Especially if it refers to the latest risk assessment, where at the beginning various factors can be considered, such as the long process in government bureaucrats, or relations with indigenous peoples.</li> <li>• Anderson and Jack considered the PBDE and UPOP projects in Indonesia to be very successful, especially if you consider that the final stages of this Project are being overshadowed by the COVID 19 pandemic, many experiences can be taken and replicated in other activities and also in order to cover even bigger issues related to waste in Asia. Pacific. Especially considering that the issue of PBDE and UPOP is one of the issues that is getting attention at the regional level. Perhaps with this experience it can expand to other new projects in the sector related to plastics, copper, metals, and various other wastes under the Stockholm convention.</li> <li>• Regarding the problem of sustainability, the UPOP PBDE project offers a variety of interesting solutions, for example by incorporating a waste bank managed by the community. This needs to be integrated into a sound economic model to ensure not only economic sustainability in hazardous waste management but also ensure that this hazardous waste does not re-enter the economic cycle system.</li> </ul>
<b>Consultation with Mr. Kurnia Hanafiah Former Project Manager PBDE/UPOP</b>	<ul style="list-style-type: none"> <li>• Mr Kurnia Hanafiah held the position of PBDE UPOP project manager from 2016 to early 2020 and was involved from the design to implementation phase. So far, project documents have always been used as the main reference in project implementation.</li> <li>• Some of the obstacles encountered so far are the change in the National Project Director from one sector to another at the Ministry of Industry. The transition period is elongated so it takes more time to reach the same level of performance from one NPD to the next.</li> <li>• During the project implementation period under Mr Kurnia Hanafiah, there were four project board meetings held. The report details will be shared with the TE team.</li> <li>• According to Mr Kurnia Hanafiah, there has been a significant reduction in POP and PBDE emissions. Although there is a bit of complexity in harmonizing</li> </ul>

	<p>communication between the two ministries where the UPOP PBDE issue is ruled, (the Stockholm Convention is regulated under the Ministry of Environment and Forestry, while the derivative regulations regarding PBDE and UPOP waste are in the Ministry of Industry.) However, these problems can be resolved and currently the draft changes to government regulations UPOP PBDE emissions are waiting for the president's signature.</p> <ul style="list-style-type: none"> <li>• There are many lessons that can be taken from this UPOP PBDE. NPD had once proposed a plastic waste management process using a breakthrough bacterium to break down the pastes. This Project is also very adaptive in terms of receiving input or applying lessons learned from other countries such as India.</li> <li>• The Mini Depot is considered very successful in encouraging changes in community behaviour, especially at the household level. Although the main goal is not to make a profit, but so far, the mini depot can operate independently from the efforts of selling and recycling waste. UNDP is pushing for an MoU between the mini depot and the industry so that the plastic industry buys raw materials from the mini depot. various business processes carried out at the mini depot level include washing, cleaning, shredding and drying of plastic waste.</li> </ul>
<p><b>Consultation with Muhamad Yusuf, S.E., MPP, Ministry of Finance</b></p>	<ul style="list-style-type: none"> <li>• Ministry of Finance (MoF) judges that the PBDE UPOP Project has Clear and concise method, from the beginning they have followed the govt regulation.</li> <li>• For this Project MoF has formulated new regulation where UNDP and Ministry of Industry (MoI) dan implement the Project itself and only obliged to report periodically regarding the Report to MoF. Asset they have gained. Report in regular manner regarding the use of finance (donors received and disbursed)</li> <li>• The report is important to determine how much money has been flowing to the government of Indonesia. This kind of report also become part of the bigger report from ministry of finance to house of representatives. It will be use as a basis to formulate policy/decision and forecast the future budget received by the government.</li> <li>• This Project has also been regarded as very efficient by MoF since it follows UNDP Procurement practices which is shorter than the governmental procurement process.</li> <li>• MOF has appreciated this Project very much. Based on their experience from field visits, MoF regarded that this Project has succeeded in creating valuable asset and involving people surrounding the areas.</li> <li>• The Project has exceeded expectations, where the impact far exceeds the number of donors received. This Project has created changes in behaviour in the people around the depot. MOF also witnesses based on numerous visit and meetings that there is a nice flow between academia, MoI, Bappenas, and other lines of ministries including Ministry of Environment and Forestry</li> <li>• Moving forward, there have to be ways to foster a partnership with private, community and local govt. We can't rely solely on the community to build their mini depots in this Project. By the end of the Project, the financing will be exhausted.</li> <li>• The participation of local governments has also been observed in many areas where the mini depot located. Some villages even allocate around 1 billion rupiah</li> <li>• MOF also eager to help by connecting to a different department within MOF to replicate a similar method in other areas.</li> <li>• The management of the finance in the mini depot they visited has also been regarded as very useful by MOF. Where the land provided by local government. The Project has only pay for machinery. It quite sufficient in terms of sustainability for operation.</li> <li>• As to replicate this similar method in other areas by only depending on private sector, it would be challenging as they have to work with local and central govt, especially to disseminate information and foster awareness. Difficulty approaching the people as well as in terms of land clearance needs govt support as well.</li> <li>• MOF currently has a govt called PPP. To bridge private sector and govt interest.</li> <li>• Demand and Supply for plastic waste must be created sustainably. Organic and plastic separation method has also need to be invented and well managed to create a system where collecting plastic would be much easier</li> <li>• This Project can be replicated in different scheme of Project which also incorporate larger issues or larger areas.</li> </ul>

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Tuesday December 22, 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Ms. Laksmi Dhewanti . GEF Focal Point in Indonesia</b>	
Agenda Item	Key Points
<b>Consultation with Ms. Laksmi Dhewanti, MoEF/GEF Focal Point in Indonesia.</b>	<ul style="list-style-type: none"> <li>• The UPOP PBDE regarded as a project that is align with national policy. Alignment of a project with national policy in Indonesia is one of the requirements for any GEF projects including in Indonesia.</li> <li>• Any project funded by GEF needs to be align with GEF agenda and comply 3 criteria: Align with current program cycle, in line with the international convention objective and national priority</li> <li>• Ensuring a healthy environment, is a mandate from Article 28-point H paragraph 1 of the Indonesian Constitution. Therefore, Indonesia ratifies numerous multilateral conventions related to chemical and on this case Ministry of Environment and Forestry (MOEF) became the National Focal Point for Chemical Waste.</li> <li>• This PBDE UPOP project also align with Indonesian National Medium Term Development Plan (RPJMN), ministerial strategic plan (RESNTRA) and related chemical waste convention signed by Indonesia.</li> <li>• This Project also promote tighter cooperation among line of ministries related to chemical waste. For instance, for chemical related substance and waste is under the domain of MOEF, while the industrial capacity related chemical waste is under the domain of Ministry of Industry (Mol)</li> <li>• Ibu Laksmi hopes that the existence of this GEF funding will be able to encourage Indonesia to be more independent in preparing environment-related funding. He analogized this GEF funding as icing on a cake. For the cake itself, the Indonesian government must prepare it independently.</li> <li>• According to the Ibu Laksmi, every program funded by GEF must have a mature plan for an exit strategy and must ensure sustainability.</li> <li>• For UPOP itself, which is associated with other chemical problem handling projects, it is considered to have had a positive impact, especially in strengthening cooperation between government agencies and increasing a sense of ownership in the Project.</li> <li>• However, even though UPOP is considered to be successful, GEF will not finance similar projects regarding chemical waste in the future due to limited budhet and will focus on other issues to be handled such as biodiversity.</li> <li>• However, the UPOP project has sparked discussions for other activities such as handling plastic waste in the ocean, issues of POP in textiles, the electronics industry, mining, and accelerating the circular economy process of plastic waste.</li> <li>• If there are things that need to be improved at the design stage, then Mrs. Laksmi proposes to encourage close collaboration with stakeholders from the start, even though Mrs. Laksmi realizes that the government's treatment of the issue of chemical waste is still lacking and very different from other environmental issues such as biodiversity and waste.</li> </ul>

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Wednesday, December 23, 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Agus Prabowo, Head of Environment Unit UNDP</b>	
Agenda Item	Key Points
<b>Consultation with Agus Prabowo, Head of Environment Unit UNDP</b>	<ul style="list-style-type: none"> <li>• According to Mr. Agus Prabowo , this PBDE project is very good, but in its implementation, UPOP PBDE activities are very dependent on many stakeholders both at national and sub-national levels so that it is difficult for UNDP to control its performance. For example, for the construction of a mini depot in a pilot village, it not only requires a permit from the central ministry, but also from the village government, and other local government work units. Not to mention taking into account office politics and the frequent change of officials.</li> <li>• Some suggestion from Mr. Agus Prabowo:</li> <li>• The issue of chemical waste must be in direct contact with the community at the grassroots level. It doesn't have to always depend on the local government. Provide sufficient education and information. And it is also necessary to establish aspects of community livelihoods where behaviour change must be able to bring positive impacts not only on the environment but also on the economic level.</li> <li>• Good design should be good business. People doesn't care about the env issue, but they care about the livelihood.</li> <li>• The existence of the mini depot must be replicated.</li> <li>• The private sector needs to be involved to ensure sustainability</li> <li>• It is necessary to find a more promising plastic recycling business model, involving the private sector and local governments.</li> </ul>

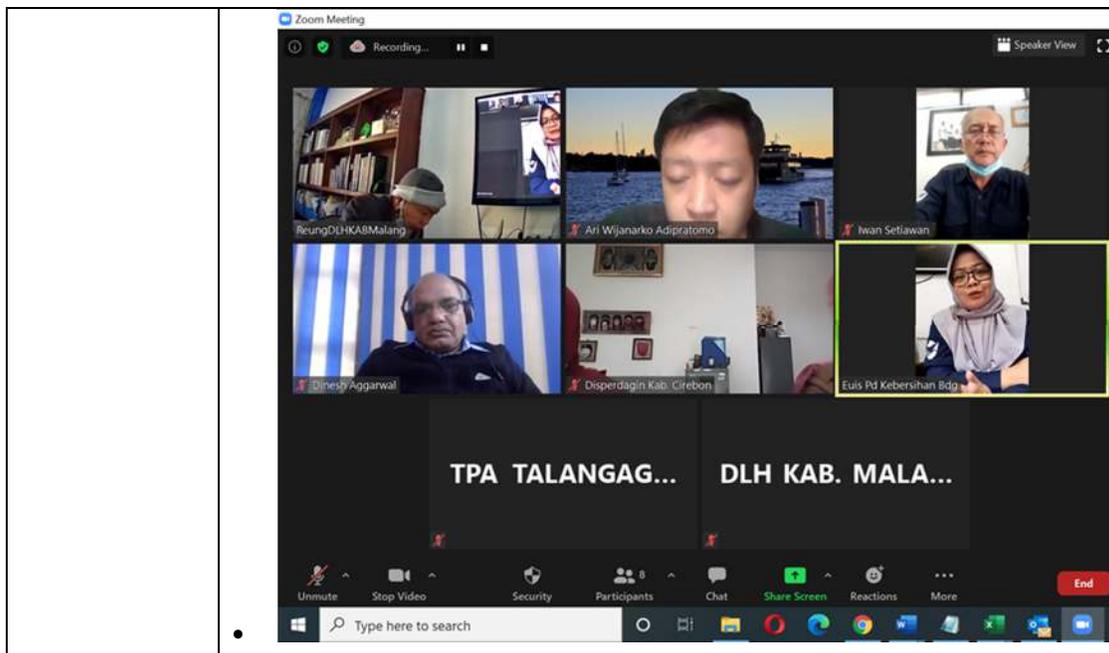
<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Wednesday, December 23, 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Ms. Anton Irawan, Academician, University of Sultan Ageung Tirtayasa (UNTIRTA), Banten.</b> 3. <b>Mr. Fransiscus Yunus Academician, University of Surabaya (UBAYA).</b>	
Agenda Item	Key Points
<b>Consultation with Academicians</b>	<ul style="list-style-type: none"> <li>• These two universities (Sultan Ageng Tirtayasa University and the University of Surabaya) were asked to monitor UPOP PBDE waste in several industries in Banten and East Java Provinces where there are many large-scale electronic industries in both provinces.</li> <li>• So far, no traces of PBDE have been found in electronic products from industries in the two provinces.</li> <li>• In the FGDs in several areas in Banten there was also no indication that a medium-scale factory was using PBDE. However, there is one party who discussed separately and acknowledged that there are possible traces of PBDE in their product. However, because it is not formally recognized, it cannot be justified.</li> <li>• In the effort to tracing PBDE, lab tests of HDPE product samples have also been carried out in several industries, but due to the limited capabilities of the existing tools, which are only able to measure PBDE at the level of Part per million (PPM) not Part per Billion (PPB). On the PPM scale, PBDE levels are not found, but that does not mean that PBDE does not exist, because it could be that the levels are very low and are in the PPB unit</li> <li>• It is also known from lab testing that until now there is no raw material for a plastic mixture that is equivalent to PBDE and has similar quality.</li> <li>• From Pak Anton's experience as an independent consultant who was assigned the task of analyzing regulations related to PBDE in Indonesia, it was found that there were several gaps in the PBDE regulations. First, lack of coordination with customs. Where this is the main route for PBDE entry at the industry level. Regulations related to PBDE are under the domain of the Ministry of Industry, while the Stockholm convention focal point is the Ministry of Environment and Forestry, but control of the entry of toxic raw materials is at Customs and Excise. Not to mention that the PBDE testing equipment is still limited.</li> <li>• Meanwhile, Pak Yunus and his university specifically target the provision of education and information related to PBDE and mapping of PBDE waste streams in recycling centers in several cities in East Java.</li> <li>• It was found that many waste treatment processes are still not up to standard and a lot of plastic waste is at risk as imported commodities in Indonesia.</li> </ul> <p><b>Some suggestions:</b></p> <ul style="list-style-type: none"> <li>• It is necessary to formulate a regulation that regulates how to treat hazardous or B3 waste properly. Especially in the process of taking metal from electronic waste. It is necessary to find a circular economy model to ensure that plastic waste, electronic waste and metal waste can be managed properly.</li> <li>• The mini depot also needs to involve middle-level collectors and individuals to ensure that the mini depot can get maximum profit and be able to increase the selling value of the mini depot's processed products.</li> <li>• Cooperation and communication at the grassroots level between government agencies need to be strengthened.</li> <li>• The mini depot management organization needs to be strengthened to ensure accountable and responsible management. It needs the involvement of the government and the private sector</li> </ul>

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Wednesday, December 23, 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Mr Saechu, Babakan Village Development Agency</b> 3. <b>Mr Asep, Mini Depot Leader in Babakan</b>	
Agenda Item	Key Points
<b>Consultation with Cirebon Stakeholders</b>	<ul style="list-style-type: none"> <li>• According to Pak Asep as the manager of the mini depot, the existence of this mini depot has had a very positive impact on their village.</li> <li>• This mini depot serves 15,000 residents in Babakan Village, consisting of 10,000 Islamic boarding school students and 5,000 local residents.</li> <li>• Before the UPOP PBDE activity, the people in the village disposed of rubbish carelessly, either in drains, rivers, or rice fields. There are some pieces of waste that are used by scavengers to sell but not optimally. After the PBDE UPOP project, various trainings and also the establishment of a waste bank, the community became more aware of the importance of waste management and maintaining a clean environment.</li> <li>• After the UPOP PBDE program entered Babakan Village, the community understood the importance of sorting waste and felt the positive impact in the form of additional income from the sale of household plastic waste. For villagers it is exchanged in the form of money, while for residents of the pesantren it is exchanged in the form of cleaning tools or stationery.</li> <li>• The existence of the mini depot also has a positive impact in improving the lives of local residents. In addition to an increase in living standards, you can also feel the environmental impact that is no longer polluted by plastic waste.</li> <li>• The mini depot operation is considered to be quite profitable. For example, before the existence of machines, the price of processed plastics was only 1500 per kilogram (11 US Cents / Kg) to 7,000 Rupiah per kilogram after processing (50 US cents / kilogram). They collaborated with several plastic recycling centers in Cirebon so that they were able to achieve good profits. The mini depot has also opened a plastic milling or chopping business for recycled waste collectors around Babakan village who do not have plastic chopping machines and receive milling fees as a profit.</li> <li>• To carry out the mini depot operation, the community forms a management body consisting of government representatives, Islamic boarding school representatives and community representatives. There is also a management system that oversees operations, finance and marketing.</li> <li>• The capacity of the chopper is 2 tons per day, but currently it can only operate up to 1 ton because of limited financial and human resources. It is hoped that in the future, with the help of an injection of funds from the village government, the machine capacity can be maximized.</li> <li>• Regarding sustainability, there are two schemes that are currently being explored by the management, namely using financial assistance from the Village Government to increase profit and operating capacity or accepting offers of cooperation and capital injection from local entrepreneurs who are concerned about pollution issues.</li> </ul> <p><b><u>Village representatives</u></b></p> <ul style="list-style-type: none"> <li>• First, they are currently unable to provide financial support because there are no village regulations or regulations governing this, so there is no form of funding support from the village government to the mini depots.</li> <li>• Second, there has been no formal handover from the ministry of industry to the village government, making it difficult for the village government to prepare a legal umbrella regulation to provide support to mini depots.</li> </ul>

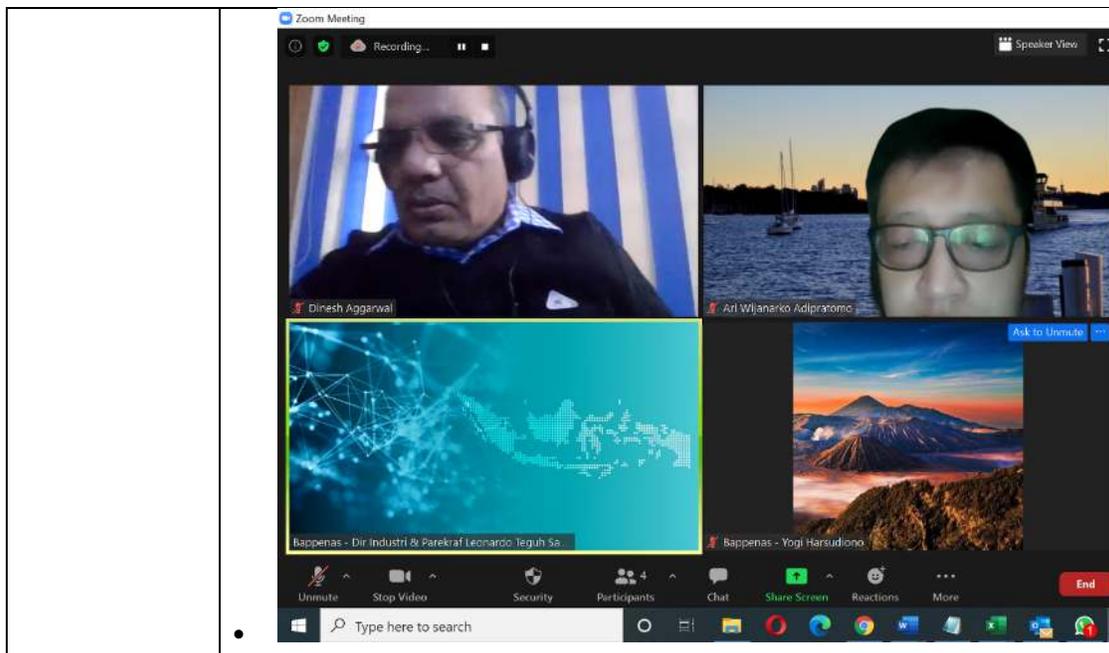
<b>PBDE UPOP Terminal Evaluation Phase</b>	
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<b>ATTENDEES:</b>	
<ol style="list-style-type: none"> <li>1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b></li> <li>2. <b>Albert, Waste for Change</b></li> <li>3. <b>Gita, PARAGITA Waste movement</b></li> <li>4. <b>Yasmin, Lohjinawi NGO</b></li> </ol>	
Agenda Item	Key Points
<b>Consultation with NGO Stakeholders</b>	<ul style="list-style-type: none"> <li>• Yasmin and Albert are two consultants who assist the process of UNDP's PBDE activities in Babakan Village, Cirebon. Especially to provide waste management education to 40 Islamic boarding schools in Babakan and community representatives in Babakan Village. According to their accounts, before the PBDE UPOP project the waste in Babakan was not well managed. Garbage pollutes rivers, rice fields, and is also openly burned in the Islamic boarding school garbage collection tub. However, after the PBDE UPOP project entered there, the community understood how to sort and manage waste and also bring added value, even raised people's lives and opened new jobs. In addition, the community also gets an understanding of good waste bank management.</li> <li>• Gita is one of the waste issue activists who got the opportunity to be a participant in the TOT training on PBDE issues and then implemented a plastic waste sorting system containing PBDE in the areas under his guidance in Garut and also in Tulang Bawang Barat, Lampung. The problem encountered in the field is that there is still a lack of recycling centers that accept PBDE waste in remote areas, making it difficult for them to process or sell it and only collect it. In addition, the distance for plastic waste collectors is quite far from the target area so that the benefits are not maximal, not all areas have collectors who want to take plastic waste to the community directly.</li> <li>• All of them suggested several things</li> <li>• First, there is continued assistance from UNDP regarding PBDE and UPOP, considering that the mini depot is only operating before the completion of the Project.</li> <li>• Second, there is integrated support from the private sector and the government</li> <li>• The third is the need for the establishment of professional waste management in mini depots</li> <li>• Fourth, the need to increase the number of minidepots throughout Indonesia</li> <li>• The fifth is the need for support from the central government to local governments to maximize the potential of mini depots.</li> </ul>

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Thursday, December 24, 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Anton Sriprobiantono, Senior Program manager, UNDP</b>	
Agenda Item	Key Points
<b>Consultation with UNDP Senior Program Manager</b>	<ul style="list-style-type: none"> <li>• Reducing chemical pollutant is a Challenging activities, for Government of Indonesia (GOI). the GoI has strong commitment to address the UPOP and also other hazardous and chemical of the country</li> <li>• MOEF is the Focal point for the chemical and hazardous waste. UNDP have good communications with other ministries including National Agency for Technology Assessment ( BPPT) , Ministry of Industry, Ministry of Trade, Custom and Excise Director General and Ministry of Finance</li> <li>• The good relations with line of ministries have been established even before some of them merged such as Ministry of Environment and Forestry (Previously were ministry of environment and ministry of forestry)</li> <li>• UNDP Pushed the National Action Plan on PBDE. Promoting the issue with other line of related ministries, such as with Ministry of Agriculture on fertilizer. Director General of Custom and Excise and Ministry of Trade</li> <li>• UNDP Feels that need to also address PBDE from manufacturing.</li> <li>• Pak Kurnia the former project manager was the official of Ministry of Industry (MoI) working with PBDE UPOP in MoI. He had good passion and understanding, international perspective. when he retired he is offered to lead the PBDE UPOP Project. UNDP have had prior engagement with Pak Kurnia, start working together on vast areas including GHG, POP, Refrigerant, Minamata Convention</li> <li>• Stockholm, Rotterdam and Basil Convention become umbrella regulations</li> <li>• Any Project has limited budget and therefore can't support all kind of activities. Instead, it is hoped that the Project could spark activities as well as foster support from community based organisation.</li> <li>• There are compelling evidence on the strong commitment from the government . Other donors are also intrested . Some area such as Bandung has strong activities. Only to trigger innovative ideas from their perspective</li> <li>• Regarding some of the area where the Project lacking, Anton mentions some of the aspect</li> <li>• Although PBDE project Targets plastic, but we also include organic waste in this Project. Organic composting is not economically viable. Viability is suffering since they also involving organic collections.</li> <li>• Some of the location designated as mini depot area are considered as historic area, the land can't be released by local government. Municipal waste also complicates the operation process. In addition. Recommendation by MoI took some time to be obtained.</li> <li>• Limited capacity of Indonesia Lab to detect PBDE. It is important to strengthen their own lab capacity/technology. dont let indonesia be international garbage dump</li> <li>• Some suggestion from Anton:</li> <li>• We should engage plastic recycling industry in addition to manufacturing industry. We have to also involve municipality government. Learn the best practice such as in Surabaya on how to manage municipal waste. Surabaya City has 0 municipal waste.</li> <li>• Stronger cooperation between MOI, MOEF and other related ministries. It took some time to build a strong communication among them on this Project.</li> <li>•</li> </ul>

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Monday, January 4 2021 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Iwan Kurniawan, Director of Technical and Operational; Euis Julaeha, Special Division Head, City of Office Cleanliness Bandung City</b> 3. <b>Mr Renung, Malang Regency Environmental Agency</b> 4. <b>Ms Endang, Office of Industry City of Cirebon</b>	
Agenda Item	Key Points
<b>Consultation with Regional Stakeholders</b>	<ul style="list-style-type: none"> <li>• Garbage in the city of Bandung is approximately 267 tons / day. 16.70% or 44.58 tons. Before the UNDP project entered, the waste was processed in a simple way, separating organic and inorganic waste, and partly composted for organic waste, and directly sold to collectors at a low price for some non-organic waste. Some of them were dumped at the TPA. Then there is also a large waste management unit such as mattress / springbed waste and electronic waste. However, there is no further process from this large waste.</li> <li>• After the UNDP project, with the assistance of a machine with a capacity of 2 tons / day, plastic waste could be better processed. Can be washed, chopped and pressed. However, the current machine cannot operate properly because there has been no handover from the ministry of industry. In the trial phase, it was also known that the chopped plastic granules were still too coarse and did not meet the standards desired by the recycling company, so the added value could not be estimated. And because the engine capacity is not proportional to the amount of plastic waste, a lot of plastic waste still ends up in the landfill.</li> <li>• Regarding the operational sustainability of the mini depot, it is hoped that there will be assistance and monitoring even though the Project has been completed. Especially in order to synergize with 3000 customers from 154 waste bank units in the city of Bandung and can provide long-term benefits.</li> </ul> <p><b><u>Waste management in Malang Regency</u></b></p> <ul style="list-style-type: none"> <li>• Garbage in Malang Regency is managed without being burned and uses an integrated management system. Only B3 waste is processed using an incinerator, the local government has a commitment to reduce waste by 30% by 2025. For plastic waste so far, it is processed directly to plastic collectors. After there was assistance from the chopping machine from UNDP, the plastic could be processed and pressed. UNDP provided equipment and training assistance as well as electricity capacity building. Meanwhile, the local government provides assistance in the construction of buildings near the landfill site and will be used to house chopper machines and will allocate funds to purchase machines that will complement the machine assistance from UNDP. It is hoped that in the future this TPA can become a special Technical Implementation Unit that also involves individual scavengers.</li> <li>• The Cirebon City Industry Service welcomed this activity and was considered very useful</li> <li>• The shredded plastic can be marketed to the industry</li> <li>• The industry office is also exploring the possibility of linking the cooperation between mini depots and synthetic rattan producers that have reached the export market</li> </ul>



<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Monday, January 4 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Leonardo Adypurnama Alias Teguh Sambodo, SP., MS., Ph.D. Director for Industry, Tourism and Creative Economy Ministry of National Development Planning (Bappenas)</b>	
Agenda Item	Key Points
<b>Consultation with Bappenas Stakeholders</b>	<ul style="list-style-type: none"> <li>• The role of Pak Teguh as Steering Committee and involved in monitoring and evaluation trips</li> <li>• Involved in several discussion with MoI and consultant as well.</li> <li>• Role as Bappenas to coordinate the development planning, Government Annual work plan (RKP), Government Mid Term Development Plan (RPJMN) and , Government LongTerm Development Plan (RPJP), Including the development of manufacturing sector.</li> <li>• Bappenas would like to ensure environmentally friendly manufacturing sector vision can be achieved since Indonesia moving toward more sustainable economy through Low Carbon Development approach and at the same time improving circular economy.</li> <li>• Bappenas has 3 concerns over this Project</li> <li>• First, related to regulations and policy: NIAP for PBDE, although these are based on Stockholm convention, the action plan has not been enacted under certain regulatory form, it is very loose to us to see the implementation of NAP so far.</li> <li>• It is seen as opportunity every time Indonesia become signatories for global convention, we will issue a law for this ratification. However, for POP we dont have any technical regulation (either governmental regulations or Presidential Decree).</li> <li>• how we can assure the action plan being implemented? we do have ministerial regulation, about how manufacturing company reduce PBDE at the same time not sure whether stick and carrot has been applied in balance. We need to work more on promotion side, increase private sector by increasing their understanding on PBDE and UPOP. Educate other stakeholders how they can build their way out from this pollutant. There is still room for improvement on stronger regulation. Alternative is to use or revise national regulation and to improve the standard practice of using PBDE UPOP</li> <li>• Second, is the challenge with local government related to the pollutant. Not only providing knowledge but to also understand the implication of having group of people involved in waste processing. Local government needs to be improved, especially on their knowledge on PBDE and UPOP. They have to understand Indonesian National Standard (SNI), help national government to implement SNI.</li> <li>• Third, Provide alternative materials for PBDE, we need to provide more testing labs in Indonesia. Not only falls under jurisdiction of MoI but other line of ministries as well including National Standardization Body, Knowledge Body of Indonesia.</li> <li>• Low carbon economic approach. Has been in our plan/ Improve circular economy in Indonesia</li> <li>• Improve the process and provide alternative materials.</li> </ul>



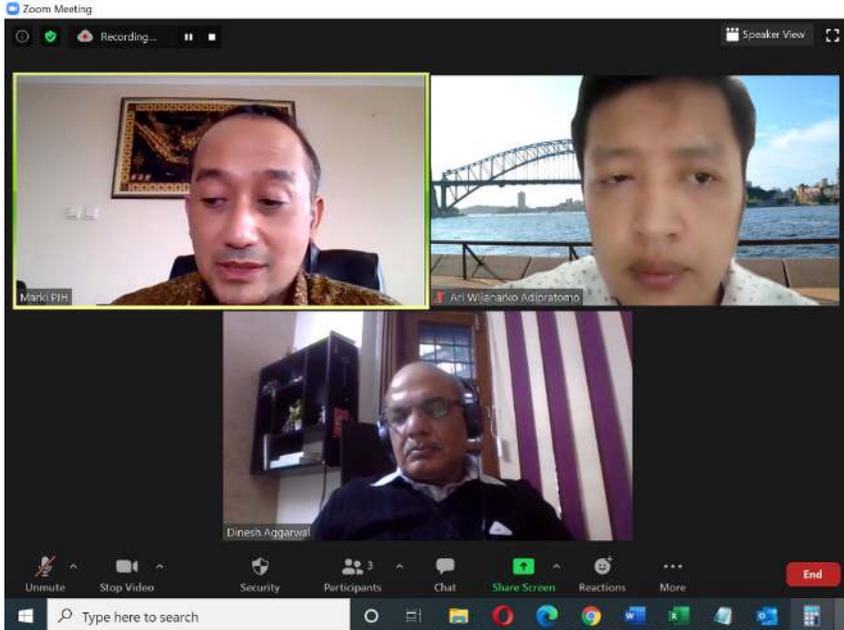
<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Tuesday, January 5 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Ms. Ety Suryahati, Head of Environment and City Cleanliness, Depok City, West Java</b>	
Agenda Item	Key Points
<b>Consultation Depok City Stakeholders</b>	<ul style="list-style-type: none"> <li>• The Environmental Agency is the agency appointed to manage waste in Depok City. Most of the waste in the city of Depok has been sorted at the household level. For organic waste, there are 32 Waste Management Units that will process the waste for compost and distribute it free of charge. Meanwhile, non-organic plastic waste is processed by 400 waste banks in the city of Depok. Even though there is a process, there is still waste that is processed at the TPA. Currently, Depok City is still in the process of procuring the new TPA in Depok.</li> <li>• In 2020 UNDP will provide assistance for plastic chopper machines and the construction of mini depots.</li> <li>• A mini depot in Depok is dedicated to sorting electronic waste from more than 200 electronic repair shops. This Mini Depot is located next to the location of the chopping machine. It is hoped that in the future this mini depot can become an integrated recycling center for waste processing. This machine cannot operate properly because there is no handing over from the Ministry of Industry.</li> <li>• Meanwhile, in the trial phase in November and December 2020, the mini depot has a capacity of 3-4 tons/day to accommodate electronic waste. This electronic waste is then channeled to the plastic processing industry and to cement factories for worthless plastics and will be used as fuel for the cement industry. Plastic waste that can be sold is chopped and cleaned before selling.</li> <li>• It is hoped that the mini depot can reduce the potential for pollution in the city of Depok. And it can become the center for integrating and providing added value to the 400 garbage banks in Depok. In the early stages the Depok City government will provide funding support for 1 year to cover employee costs and operational costs. When the collaboration between the mini depot and industry and the private sector has been achieved, Depok City will form a management unit that involves the community and relinquishes ownership of the mini depot to the community.</li> <li>• Ety hopes that in the future UNDP will continue to provide support for training, monitoring and evaluation. Ety also hopes for the support of a comparative study of TPA management systems from other countries to learn best practices for waste management</li> </ul>

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Wednesday, January 5 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Mr. Budi Heriyanto, Head of Waste Management Division, Office of Environment Malang city</b>	
Agenda Item	Key Points
<b>Consultation with NGO Stakeholders</b>	<ul style="list-style-type: none"> <li>• Waste management in the city of Malang uses an integrated system where waste has been sorted at the household level, then undergoes further sorting at a temporary disposal site (TPS) before being disposed of in a landfill (TPA) with a controlled landfilled system.</li> <li>• For organic waste, there are 30 compost houses to process organic waste into fertilizer. If it exceeds the capacity, then it is discharged to TPS / TPA. Even though there was no burning at the TPA with a controlled landfill system, in 2019 there was a severe fire (even though there was already fire handling SOP) so that the government decided to build a new TPA with a sanitary landfill system that will operate in 2021. It is hoped that this TPA can have a massive impact. Provide more on the community, especially in providing methane gas supply for cooking.</li> <li>• Previously, non-organic waste was only sorted and sold directly to recycler, both by people who were customers of the waste bank and by individual waste picker / waste pickers with carts (carters). With the support of chopper machines, it is able to provide added value for individual waste pickers and carters.</li> <li>• The local government encourages the formation of scavenger associations and encourages them to become independent mini depot operators. Currently there are 3170 individual waste pickers / carters in Malang City who are members of this program</li> <li>• UNDP provides assistance in 3 areas, namely chopping machines, training for trainers and also training for the community.</li> <li>• UNDP-trained trainers provide assistance to waste pickers association which operates mini depots. Trainers are trained not only to operate but also to solve minor problems in the chopping machine</li> <li>• Meanwhile, individual waste pickers and carters are given training to identify various types of plastics. Making it easier for them to work.</li> <li>• Budi suggested that in the future the grants in form of RDF engine which will be able to help providing final solution. It is considered to be a long-term solution where this machine is able to convert organic and non-organic sap into coal substitute fuel. Budi also hopes for training from UNDP, especially in the management aspects of mini depot management.</li> </ul>

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Thursday, January 7 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Yang Yang Setiawan, Secretary to Project Board</b>	
Agenda Item	Key Points
<b>Consultation with NGO Stakeholders</b>	<ul style="list-style-type: none"> <li>• This Project is in line with the spirit of Industrial law number 3-year 2014.</li> <li>• In this law, the green industry become main projection for Indonesia in the future, in which environment is the crucial aspect for the green industry</li> <li>• Many people think that Industry is the main cause of the pollution both on land, water bodies and marine litter</li> <li>• UPOP Project in line with the vision of green industry</li> <li>• At the early stage of the Project, it's hard to determine PBDE in Indonesia. Like in most ASEAN countries, electronic waste considered valuable. Although those electronic appliances no longer working but still being kept. We also asked the POP consultant to map the electronic waste in Indonesia</li> <li>• Very success at the end. We have collected more than 1000 tons of electronic waste.</li> <li>• Screening for plastic used for cement industry fuel is tighter both before and after the burning process in cement industry. And measure the PBDE emission after the burning, none is found.</li> <li>• objective to decrease PBDE content in Indonesia, in recycle industry is also one of the objective for this Project</li> <li>• However, we need a more thorough data become confidence to say Indonesia free from PBDE.</li> <li>• Imported material contents, virgin plastic is not possible. it is banned since its containing PBDE</li> <li>• Batam is industrial areas, special zone in Economy. Imported raw materials, make casing for electronic and exported it again and the whole production process is free from PBDE since buyer also asked for PBDE free products</li> <li>• Framework of the Project considered to be very good. target to build 6 mini depot.</li> <li>• Hire reputable university, they could not detect the presence of PBDE in industry</li> </ul>

	<ul style="list-style-type: none"><li>• Household which dumps electronic waste also being prevented. establishment of 6 mini depot to help preventing the litter of PBDE from electronic.</li><li>• All 6 mini depot staffs will be trained. to recognize PBDE materials</li><li>• PBDE corners also exist</li><li>• 1 mini depot in Depok, is a good example in processing of electronic waste</li></ul> <p><b><u>Before the Project what happened?</u></b></p> <ul style="list-style-type: none"><li>• They know the electronic are valuables, they burned it. we suggest them to collect and send it to mini depot if one is existing in the area.</li><li>• Or give it to waste bank. They will then Keep it and send it to mini depot in Depok.</li><li>• Tighter regulation from MoEF means more difficult to assess hazardous materials.</li></ul> <p><b><u>Suggestion</u></b></p> <ul style="list-style-type: none"><li>• UNDP from the data obtained from this Project, collect further data through research to convince Indonesia is free from PBDE</li><li>• Marine litter also one of the main problems. Mini Depot should also trying to reduce marine litter.</li><li>• Try to change the mindset of people into thinking waste equals money</li><li>• Combine PBDE with Recycling Industry, reduce marine litter. 1 million tons should be recycled.</li><li>• Most of the waste problem in Indonesia, about 60% are organic waste</li><li>• UPOP Management managing medical waste to target the reduction of UPOP from medical waste</li></ul>
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<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Thursday, January 7 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Mr Eko Priyo (Ministry of Industry) on behalf of Ms Suzanne Agustine</b>	
Agenda Item	Key Points
<b>Consultation with ministry of Industry</b>	<ul style="list-style-type: none"> <li>• The role of the BPPI secretariat is to provide administrative support in this activity, especially regarding the Handover of Assets.</li> <li>• In the case of asset handover, it is assessed on schedule. Even though there are several obstacles caused by the COVID pandemic, they can still be on schedule</li> <li>• According to the Secretariat of the Ministry of Industry, this Project was successful, especially in cutting the amount of plastic waste. One example in Depok, West Java, is estimated that this Project will be able to eliminate 1000 tons of electronic waste and as a side activity it is also able to process plastic waste.</li> <li>• The Ministry of Industry considers that the main aspect that is trying to change through this PBDE activity is the understanding of the community so that they better understand the dangers of PBDE and how to manage them.</li> <li>• It is hoped that the existence of a mini depot will be able to add value to the circular economy. And the industry understands the dangers of PBDE.</li> </ul> <p><b><u>Regarding the handover of assets</u></b></p> <ul style="list-style-type: none"> <li>• The UNDP mechanism will first-hand over-all assets to the ministry of industry, then there will be a process for recording state revenues in the Ministry of Finance system. Only after being recorded will it be granted to the Regions. Currently, it is only the process of handing over 1 Depot in Babakan Cirebon, West Java</li> <li>• Hope: the mini depot tool can be useful for the surrounding community and can reduce plastic waste and PBDE. Replication of similar activities elsewhere.</li> </ul> <p><b><u>Obstacles.</u></b></p> <ul style="list-style-type: none"> <li>• Overall, there are no significant obstacles, only in one place (Mojokerto) cancellation of building a mini depot because the land allocated is a historical site.</li> </ul>

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Thursday, January 7 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Mr. Junadi Marki, ST., MT., Director of Center for Green Industry</b>	
Agenda Item	Key Points
<b>Consultation with ministry of Industry</b>	<ul style="list-style-type: none"> <li>• Pak Marki is the new Head of PIH. The Green Industry Center in this Project becomes the Project Deputy Director. Judging that this activity is very good because it creates a scheme to pull back waste with PBDE and UPOP content into a circular economy and processed with world standards. This Project also helps the government monitor whether there are plastics containing PBDE circulating in the market.</li> <li>• So far, based on reports received from the PBDE project, Mr. Marki has not found any reports regarding the findings of PBDE-UPOP content in the Industry. Likewise, reports from the mini depot have not been found.</li> <li>• Recycling activities had occurred before the UPOP PBDE project activities and were undertaken informally. The Ministry of Industry seems to be</li> </ul> <p><b>Suggestion:</b></p> <ul style="list-style-type: none"> <li>• Adopting lessons learned from other regions. For example, waste management in Jakarta can reduce 70% of waste in Jakarta.</li> <li>• To ensure sustainability, it must be able to balance the roles of all parties by considering the capacities of each party. The participation of local governments, communities, educational institutions as well as local officials must be able to be coordinated</li> <li>• Plastic is a material that can be recycled, very useful. Must be a solution in the economy and not a problem</li> <li>• In order to embrace the industrial sector to create recycling centers</li> </ul> 

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Friday, January 8 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Made Santihayu Sukma, I Putu Sutrisna, Aji Setyawan, PT Cagar Bentara Sakti Engineering</b>	
Agenda Item	Key Points
<b>Consultation with CBS</b>	<ul style="list-style-type: none"> <li>• CBS is a consulting company that focuses on climate change issues, waste and chemical waste in Indonesia, based in Depok</li> <li>• This consultant joins the final phase of the Project and concentrates on UPOP issues</li> <li>• This consultant provides a report on how best to detect UPOP as well as what tools should be used; undertake educational efforts regarding curing PBDE containing plastic from circulating used plastic materials</li> <li>• CBS found the fact that industry players were actually very interested in getting capacity building from the government but did not know the path</li> <li>• Some industry players were also mistaken about the UPOP PBDE program at first and were even afraid that their business would be closed if violations were found</li> </ul> <p><b>Input:</b></p> <ul style="list-style-type: none"> <li>• In order to duplicate the same activities on a wider scale so that the impact is more significant</li> </ul> 

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Friday, January 8 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> <ol style="list-style-type: none"> <li>1. <b>Dinesh Aggarwal (India); Independent Evaluation Consultant</b></li> <li>2. <b>Ari Wijanarko Adipratomo (Indonesia); Independent Evaluation Consultant</b></li> </ol> <p style="text-align: center;"><b>Ministry of Development Planning (BAPPENAS)</b></p> <ol style="list-style-type: none"> <li>3. <b>Dr. Rd. Siliwanti, MPIA Director for Multilateral External Funding</b></li> <li>4. <b>Dory Widyanasari, Staff of the Directorate of Multilateral External Funding</b></li> <li>5. <b>Muhammad Fadhi, Staff of the Directorate of Multilateral External Funding</b></li> <li>6. <b>Rizki Bagastari, Staff of the Directorate of Multilateral External Funding</b></li> <li>7. <b>Wiwien Apriani, Staff of the Directorate of Multilateral External Funding</b></li> </ol>	
Agenda Item	Key Points
<b>Consultation with Bappenas</b>	<ul style="list-style-type: none"> <li>• The Multilateral Directorate of Bappenas has special attention to various projects in Indonesia, especially those that receive funding from abroad</li> <li>• The main point underlined by the multilateral director was the aspect of sustainability.</li> <li>• Regarding the achievement, according to the Multilateral Director, it has been very good. Although he did not participate directly, it is understood from the report that this Project has had a major impact especially in eliminating the remaining PBDE from old plastic products. Likewise, in making the guidelines considered to be very successful</li> </ul> <p><b><u>Issue which should be considered</u></b></p> <ul style="list-style-type: none"> <li>• Exit strategy, make sure in the closure document the exit strategy is clearly defined.</li> <li>• What is worrying is that after there is no funding, the aid machines will no longer operate. Another thing that needs attention is the aspect of public awareness that needs to be strengthened</li> </ul> <p><b><u>Suggestion</u></b></p> <ul style="list-style-type: none"> <li>• Scale up similar projects and replicate in different areas</li> </ul> 

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Friday, January 8 2020 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> 1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b> 2. <b>Ir. Yun Insiani, M.Sc. Director of Management of Toxic Hazardous Materials, Ministry of Environment and Forestry</b>	
Agenda Item	Key Points
<b>Consultation with Director of Management of Toxic Hazardous Materials, Ministry of Environment and Forestry</b>	<ul style="list-style-type: none"> <li>• The B3 Directorate provided support from the start as well as during the implementation stages of this Project</li> <li>• The Indonesian party of Stockholm convention and the Indonesian government have ratified it through legislation and also provided technical rules in the 47 the year 2001 government regulation, which made all these legal products reflect Indonesia's commitment to regulating POP</li> <li>• However, the currently number of banned UPOP increase. Existing regulation only regulates 10 UPOP. Therefore, we need to revise government regulations</li> <li>• Directorate of B3 MOEF Strongly supports PBDE UPOP. Based on the project's information, they understand some illegal practices in recycling plastic containing PBDE might still exist.</li> <li>• The results of the PBDE will give us input to prepare stronger regulations. Currently, finalize the revised regulations and New Regulation will roll out this year</li> <li>• Regulation has to be updated to create updated action plan, by using the information from the Project to update the situation we will be able to strengthen the regulation.</li> <li>• PPE and other hazardous waste increase incredibly during the pandemic. UNDP should support this area to strengthen the regulation</li> <li>• New Project supported by multilateral funding is a good vehicle inclined to increase a certain issue's visibility</li> <li>• We have to update our action plan every 2 years based on the Stockholm convention provision. Draft submission on Stockholm reporting and follow up plan on hazardous waste will be shared to evaluator</li> </ul> 

<b>PBDE UPOP Terminal Evaluation Phase</b> Minutes of Meeting held Tuesday, January 12 2021 Zoom/MS Team meeting Room.	
<b>ATTENDEES:</b> <ol style="list-style-type: none"> <li>1. <b>Dinesh Aggarwal (India); Ari Wijanarko Adipratomo (Indonesia): Independent Evaluation Consultants</b></li> <li>2. <b>Haendry Chavelier, Secretary General of Association of Plastic Downstream Industry in Indonesia (APHIND)</b></li> <li>3. <b>Nurul Latifah, Entrepreneur in Recycling Industry</b></li> <li>4. <b>Chatarina Indirastuti, Social and Gender Independent Consultant</b></li> <li>5. <b>Karlina Bone, TUV NORD.</b></li> </ol>	
Agenda Item	Key Points
<b>Consultation with Stakeholders</b>	<ul style="list-style-type: none"> <li>• Hanedry Chavelier from APHIND</li> <li>• Haenry is a representative of the Downstream Plastics Industry. Representing many types of industry players in the plastic sector</li> <li>• Haendry feels that this UPOP PBDE activity is very useful for the industry, especially in helping to analyze the content of PBDE and UPOP</li> <li>• There are members of APHIND who are allegedly still using mixed products containing PBDE, such as the household appliance plastic industry. Meanwhile, the car accessories industry may still use additives containing PBDE</li> <li>• APHIND members do not have the tools to detect PBDE content. They believe that this tool is only available in the mini depot. APHIND helps as much as possible, including by socializing the dangers of UPOP PBDE</li> <li>• APHIND provides full support for this activity and considers it a form of social responsibility for industry associations. APHIND also intends to prepare independent mini depots in several regions</li> </ul> <p><b><u>Karlina Bone from TUV Nord</u></b></p> <ul style="list-style-type: none"> <li>• Play a role in providing capacity building assistance to the plastic industry in various regions including Jakarta, West Java, East Java and Batam</li> <li>• Provide training on how to meet ISO 9000 requirements and several other ISO requirements.</li> <li>• In addition, it also provides training on ISO certification and audits</li> </ul> <p><b><u>Nurul Latifah and Chatarina Indirastuti</u></b></p> <ul style="list-style-type: none"> <li>• Nurul Latifah is a recycling business actor in Mojokerto, East Java and Chatarina is a social researcher who researches gender in plastic recycling efforts in the PBDE project.</li> <li>• Regarding working conditions in the recycling industry</li> <li>• Most of the recycling industries in various regions are informal industries. Done both at home and large scale. A number of places still do not understand work safety, especially in working with plastics, but others do.</li> <li>• Differences in roles between men and women</li> <li>• Men and women are equally represented in the plastic recycling industry.</li> <li>• In the division of labor, women played a lot in the early stages (garbage collection, sorting, washing) while the advanced stages, namely enumeration and pressing, were not much involved. Not because of discrimination or differences in social class or customary rules, but rather on differentiation of roles based on workload, where the plastic counting and pressing stages require large power and the use of machines with high power where most of the women are considered not to have the same physical strength.</li> <li>• Because there are differences in job roles, women receive slightly less income than men</li> </ul>

- Likewise, in the ownership of a recycled waste processing business. Men dominate the legality of business ownership, although in practice, this business is a family business where women also dominate operational management.



## ANNEX F: PROJECT RISKS AND RISK MITIGATION

### Risks identified at the time of project design and the proposed risk mitigation measures (as per Project Document)

#	Risk Description	Proposed Risk Mitigation Measures
1	Delay in adoption as overlapping mandates of ministries	Project's multi-stakeholder coordination will ensure coordination and agreement between the ministries.
2	Poor project ownership or commitment to the project's implementation by any of the project's stakeholders causing a barrier during data collection, but also negatively impacting project implementation and its success.	All project stakeholders will be fully involved and engaged throughout the project's proposal planning phase, their buy-in with respect to project objectives, outcomes and activities as well as responsibilities of different stakeholders will be incorporated in the project document/ proposal. Awareness raising will be conducted in such a manner that the focus will be on the economic and social advantages of project implementation as well as the use of BAT/BEP, ensuring the commitment to project implementation of all stakeholders.
3	Slow implementation of barrier reducing measures such as the further development and adoption of revised strategies, policies and regulations pertaining to the use of PBDEs in industry, safe and environmentally sound practices in plastics recycling and disposal.	The proposed project supports GOI in the strengthening of the national policy and regulatory framework pertaining to these sectors, thus the project itself can influence the timing of the creation of an enabling environment. Waste management is a public and government priority and as such the risk is deemed very low. However, particularly with respect to the informal plastics recycling sector the risks are deemed moderate, as incentives
		in the informal sector often are financial and to a lesser extent health related. Due to this the project approach puts high emphasis on economic incentives for informal sector to separate PBDE containing waste and the sustainability of these incentives.
4	Industry and commerce sectors opposition to EPR and consequent delays.	Series of information meetings with experiences from other countries on the success and easiness of establishing EPR for electronics.
5	Establishment of routine identification scheme takes longer than anticipated to reach goals.	Recycling cluster involvement and interest indicate that critical number of plastic processors willing and able to invest in BAT/BEP. Incentives to move fast to be established.
6	Making mini-depos commercially viable in low-income communities.	Education that all also commercially valuable waste should go through depo to keep it viable
7	Waste to Energy project in Bandung and landfill enlargement in Surabaya delayed.	Keep up urgency through community and NGO involvement.
8	Climate risks from changing weather patterns and sea level rise, may increase leaching of toxics from recycling operations or waste depots	The recycling cluster locations and susceptibility to sea-level rises and increased flooding will be mapped during introduction of BAT/BEP in the clusters. The mini-depos will be established at elevated locations from rivers.
9	Political situation, especially the general election that takes place may change the post in the Ministry of Industry and other relevant ministries.	It will require extended time for adjustment and adaptation.
10	Tour of duties. The Implementing Partner and relevant stakeholders is transferred to other post.	It will require extended time for adjustment and adaptation.

## **ANNEX G. CONSULTANTS CODE OF CONDUCT FORM**

Evaluators/reviewers:

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.

Evaluation/reviewer Consultant Agreement Form

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

Name of Consultant: Dinesh Aggarwal

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

Signed at Noida, India



Signature:

Evaluators/reviewers:

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.
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7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

**Evaluation/reviewer Consultant Agreement Form**

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

Name of Consultant: Ari Wijanarko Adipratomo

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

Signed at Bogor, Indonesia



Signature:

## ANNEX H: AUDIT TRAIL

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

In accordance with the procedures, Audit Trail is being submitted as a separate file

## **ANNEX I: EVALUATION REPORT CLEARANCE FORM**

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**Terminal Evaluation Report for *Reducing Releases of Polybromodiphenyl Ethers (PBDEs) And Unintentional Persistent Organic Pollutants (UPOPs) Originating from Unsound Waste Management and Recycling Practices and the Manufacturing of Plastics in Indonesia* (PIMs ID 5073/GEF ID 5052) Reviewed and Cleared By:**

**Commissioning Unit (M&E Focal Point)**

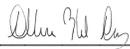
Name: \_\_\_\_\_ Mr. Teuku Rahmatsyah \_\_\_\_\_

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

Date: \_\_\_\_\_ 10-May-2021 \_\_\_\_\_

**Regional Technical Advisor (Nature, Climate and Energy)**

Name: \_\_\_\_\_ Mr. Anderson Alves \_\_\_\_\_

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

Date: \_\_\_\_\_ 10-May-2021 \_\_\_\_\_