

## Reduction of POPs and UPOPs through integrated sound management of chemicals

### Part I: Project Information

**GEF ID**

10686

**Project Type**

FSP

**Type of Trust Fund**

GET

**CBIT/NGI**

☐ CBIT

☐ NGI

**Project Title**

Reduction of POPs and UPOPs through integrated sound management of chemicals

**Countries**

Philippines

**Agency(ies)**

UNDP

**Other Executing Partner(s)**

Department of Environment and Natural Resources and Environment of the  
Philippines – Environment Management Bureau

**Executing Partner Type**

Government

**GEF Focal Area**

Chemicals and Waste

**Taxonomy**

Mercury, Chemicals and Waste, Focal Areas, Industrial Emissions, Emissions, Persistent Organic Pollutants, New Persistent Organic Pollutants, Unintentional Persistent Organic Pollutants, Plastics, Waste Management, Green Chemistry, Best Available Technology / Best Environmental Practices, Sound Management of chemicals and waste, Non Ferrous Metals Production, Coal Fired Industrial Boilers, Eco-Efficiency, Influencing models, Transform policy and regulatory environments, Demonstrate innovative approaches, Strengthen institutional capacity and decision-making, Stakeholders, Local Communities, Beneficiaries, Civil Society, Non-Governmental Organization, Community Based Organization, Academia, Communications, Public Campaigns, Awareness Raising, Education, Type of Engagement, Information Dissemination, Participation, Partnership, Consultation, Private Sector, Individuals/Entrepreneurs, SMEs, Capital providers, Financial intermediaries and market facilitators, Large corporations, Gender Equality, Gender results areas, Participation and leadership, Capacity Development, Knowledge Generation and Exchange, Access to benefits and services, Gender Mainstreaming, Sex-disaggregated indicators, Gender-sensitive indicators, Capacity, Knowledge and Research, Innovation, Knowledge Generation, Knowledge Exchange, Enabling Activities, Learning, Indicators to measure change, Adaptive management

**Rio Markers****Climate Change Mitigation**

Climate Change Mitigation 0

**Climate Change Adaptation**

Climate Change Adaptation 0

**Duration**

48 In Months

**Agency Fee(\$)**

623,437.00

**Submission Date**

9/26/2020

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CW-1-1	GET	6,312,500.00	41,000,000.00
CW-1-1	GET	250,000.00	1,500,000.00
Total Project Cost (\$)		6,562,500.00	42,500,000.00

## B. Indicative Project description summary

### Project Objective

Reduction of the use and releases of POPs, U-POPs and GHG through the implementation of a Green Chemistry Approach in key manufacturing sectors in the Philippines.

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
1. Comprehensive roadmap for greening the manufacturing sector in the Philippines through a better management of chemicals, including an update of the Stockholm Convention National Implementation Plan.	Technical Assistance	1.1 NIP updated  1.2 A roadmap for greening of manufacturing sector through Green Chemistry principles and reduction of POPs, U-POPs and other substance of concern drafted and endorsed	1.1.1 The NIP is updated to consider the POPs listed under the SC after 2013  1.1.2. Updated inventory of POPs and U-POPs.  1.2.1. A detailed assessment of the key manufacturing sector for which a roadmap toward sustainability was already envisaged by the government (Copper, Plastic, Paper, Furniture and Automotive) carried out.  1.2.2. A Roadmap for the implementation of Green Chemistry approach inclusive of the reduction of POPs and U-POPs and GHG emission agreed and endorsed by the government.	GET	500,000.00	5,500,000.00



2. Demonstration of Green Chemistry implementation including POPs and U-POPs reduction.	Investment	<p>2.1 A sustainable financing mechanism designed and implemented in support of the Green Chemistry in key manufacturing industries.</p> <p>2.2 Implementation of Green Chemistry Initiatives in key manufacturing sectors.</p>	<p>2.1.1 A self sustaining financial mechanism (FREEME – Financing the Roadmap for the Environmental Enhancement of Manufacturing Enterprises) in support of Green Chemistry in key manufacturing sectors established with the initial technical and financial support of the project, through involvement of suitable financial institutions (Development Bank of Philippines, Land Bank), also as a proposed financial mechanism for green recovery from COVID-19 including PPE for workers).</p> <p>2.2.1 At least 4 (four) industries from the key manufacturing sectors implementing Green Chemistry approach under FREEME, with direct reduction of at least 10 tons of SCCP, PBDEs and PBBs and 10 tons of PFOS/PFOAs.</p> <p>2.2.2 Technical guidance and roadmaps for the implementation of Green Chemistry developed for the sectors of Copper, Plastic, Paper, Furniture and Automotive.</p>	GET	4,000,000.00	26,100,000.00
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3. Enhancing the chemical management and reporting of POPs countrywide	Technical Assistance	3.1. Environmental legislation improved and enforced and a reporting system for industrial emission implemented.	<p>3.1.1. The downstream regulation amended to include provisions related to all the new POPs listed under the SC after 2013.</p> <p>3.1.2. A PRTR (Pollutant Release and Transfer Register), inclusive of POPs, U-POPs, GHG and heavy metals, piloted in at least 10 factories in key manufacturing enterprises.</p> <p>3.1.3 Capacity of the customs officers to prevent illegal import of POPs chemicals, POPs containing mixtures and articles increased.</p>	GET	1,550,000.00	3,500,000.00
4. Knowledge Management & Awareness, monitoring, learning, adaptive feedback and evaluation.	Technical Assistance	4.1. Project lessons and results monitored, verified, captured, shared, sustained and replicated.	<p>4.1.1 An adaptive overall management and risk management tools and plans developed and applied for use throughout the project, and particularly in response to needs and Mid-term Evaluation (MTE) findings.</p> <p>4.1.2. Lessons-learned, best practices and experiences collected and disseminated at the national, regional and global level to support replication.</p> <p>4.1.3. Capacity and awareness building activities organized for decision makers, stakeholders, and practitioners, to enhance the sound management of chemicals and protect human and environmental health.</p> <p>4.1.4. An integrated knowledge management system developed on POPs and their alternatives.</p>	GET	200,000.00	5,000,000.00
Sub Total (\$)					6,250,000.00	40,100,000.00

Project Management Cost (PMC)

GET	312,500.00	2,400,000.00
Sub Total(\$)	312,500.00	2,400,000.00
Total Project Cost(\$)	6,562,500.00	42,500,000.00

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

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Others	Development Bank of the Philippines	Grant	Investment mobilized	2,500,000.00
Others	Land Bank of the Philippines	Grant	Investment mobilized	2,500,000.00
Recipient Country Government	Recipient Government	In-kind	Recurrent expenditures	3,000,000.00
Recipient Country Government	TESDA	In-kind	Recurrent expenditures	2,500,000.00
Recipient Country Government	Department of Environment and Natural Resources	In-kind	Recurrent expenditures	8,000,000.00
Recipient Country Government	Department of Environment and Natural Resources	Grant	Investment mobilized	4,000,000.00
Recipient Country Government	Department of Trade and Industry	In-kind	Recurrent expenditures	2,500,000.00
GEF Agency	UNDP	In-kind	Recurrent expenditures	1,000,000.00
Recipient Country Government	Local Government Unit	Grant	Investment mobilized	1,500,000.00
Private Sector	Subscription of FREEME Loan	Grant	Investment mobilized	15,000,000.00
<b>Total Project Cost(\$)</b>				<b>42,500,000.00</b>

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

Similarly to what is proposed by UNDP in the project “Reduce the impact and release of mercury and POPs in Vietnam through lifecycle approach and Ecolabel (GEF 10519)” the project will develop a Green Financing Framework (FREEME- Financing the Roadmap for the Environmental Enhancement of Manufacturing Enterprises) , consisting in: 1) eligibility criteria for projects to be submitted by the industry, to be established under the project in compliance with Stockholm convention. 2) Investment mobilized from private sector of 15,000,000 USD, for supporting projects submitted by the industries, disbursed with a competitive interest rate (around 2.5%). 3) a grant covering part of the investment made by the industries (up to 1,500,000 USD) covering the incremental cost of their projects. 4) technical support to facilitate the preparation of technical documents and layouts for submission to the Green Financing Framework. 5) tax reduction for environmental protection investment. It is expected that, given the above favorable conditions, and the stricter regulations enacted by the GOP on POPs (project component 1) the available fund placed under the FREEME will be completely booked very quickly through the projects submitted by the industry.

Therefore the combined financial and technical support from the GEF grant of 1,500,000, through the reduced interest rate provided by the Green Financing entity (estimated in USD 6,000,000 over then years if the interest rate is reduced by 4% compared to the market price), and the subscription of FREEME loan by enterprises will mobilize a grant co-financing for an overall amount of 21,000,000 USD. Other grant co-financing will be ensured through the state funds associated to environmental protection and industrial development. On the public side, it is worth noticing that, beside the in-kind co-financing, the government of the Philippine has already mobilized investment to support the roadmap toward the sustainability of the manufacturing industry. The project will integrate and further sustain those initiatives. More specifically, the government has established a) "Tax incentives for green jobs. Certification issued by the Climate Change Commission that the enterprise is qualified to avail itself of the incentives, pursuant to Revenue Regulations 5-2019 recently issued by the BIR." Eligible projects are the ones consistent with the State's objective of preserving the environment, conserve natural resources for the future generation and ensure the sustainable development of the country and its transition into a green economy. (<https://businessmirror.com.ph/2019/05/07/tax-incentives-for-green-jobs/>). b) PEPP - Philippine Environmental Partnership Programme. The PEPP seeks to provide a package of incentives and reward mechanisms to industries in effective voluntary self-regulation and improved environmental performance. The PEPP aims at encouraging enterprises to go beyond environmental compliance (<http://pepp.emb.gov.ph/philippine-environment-partnership-program/>). c) DTI / BOI have a number of initiative to support the roadmap of the manufacturing industry, including the one on the sustainable copper industry. On January 31, 2019, the Philippines Board of Investment announced the development of the Masterplan for the Leyte Ecological Industrial Zone (LEIZ) Investment mobilized through the financial institutions, are expected to provide the capital for the green loan at a privileged interest rate. As explained above, the capital is subscribed by the enterprises and counted as investment on their side. The delta between the commercial interest rate and the privileged green loan rate is the actual investment by the financial institution. (a) Development Bank of the Philippines (\$2.5 million) as reduced interest rate compared to the market rate (b) Land Bank of the Philippines (\$2.5 million) as reduced interest rate compared to the market rate Finally: (a) The Department of Environment and Natural Resources (\$4.0 million) funding will support the promotion of green chemistry through specific Agreement to be established with the agency. (b) Local Government Unit (\$1.5 million) will support to infrastructural improvement on the side of the green chemistry project approved in their jurisdiction together with the private sector.

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

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNDP	GET	Philippines	Chemicals and Waste	POPs	6,562,500	623,437	7,185,937.00
Total GEF Resources(\$)					6,562,500.00	623,437.00	7,185,937.00

E. Project Preparation Grant (PPG)  
PPG Required





PPG Amount (\$)				PPG Agency Fee (\$)			
150,000				14,250			
Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNDP	GET	Philippines	Chemicals and Waste	POPs	150,000	14,250	164,250.00
Total Project Costs(\$)					150,000.00	14,250.00	164,250.00

Core Indicators

Indicator 9 Reduction, disposal/destruction, phase out, elimination and avoidance of chemicals of global concern and their waste in the environment and in processes, materials and products (metric tons of toxic chemicals reduced)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
192.50	0.00	0.00	0.00

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

POPs type	Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	182.50			
Short-chain chlorinated paraffins (SCCPs)	10.00			

Indicator 9.2 Quantity of mercury reduced (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)



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Indicator 9.3 Hydrochlorofluorocarbons (HCFC) Reduced/Phased out (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.4 Number of countries with legislation and policy implemented to control chemicals and waste (Use this sub-indicator in addition to one of the sub-indicators 9.1, 9.2 and 9.3 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
1			

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

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)

Indicator 9.6 Quantity of POPs/Mercury containing materials and products directly avoided

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
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Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	1,012,600			
Male	1,012,600			
Total	2025200	0	0	0

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

Core Indicator 10 will be assessed at the PPG phase.

## Part II. Project Justification

### 1a. Project Description

#### THE GLOBAL ENVIRONMENTAL AND/OR ADAPTATION PROBLEMS

##### 1. The use of POPs and other hazardous chemicals in the manufacturing industry.

The manufacturing industry, through its products, their innovation efforts and the number of jobs it creates, is a fundamental pillar of the well-being of the today's society and its economy. At the same time, when a proper strategy linking the economic interest of the industry with the need to protect the health and the environment is missing, the risk of externalization of the environmental costs, which is mostly borne by the public, is high. More specifically, as the duty to assess the hazard of chemicals lies in most cases on the shoulder of the government and of public research institutions, it often happened that the risk associated with chemicals is fully appreciated and prevented only years after chemicals have been used and placed on the market. In general, this is the history of several POP chemicals – like PCBs, PBDEs, PFOSs, SCCP – which due to their outstanding technical properties, were widely used in industrial processes and only later have been discovered to represent an unacceptable source of risk for the environment and human health.

2. As the public awareness of the risk associated with the use and release of hazardous chemicals was growing, the industry has already found years ago that there are no better marketing strategies than the “green” strategies, aimed at ensuring to consumers that the products are safe and that they have been manufactured with non-hazardous processes and chemicals. When there is trust among the industry and the government, and a proper enforceable and trustable policy framework is put in place, government agencies can rely on industry research and development capacities to assess of the hazards of chemicals. This is the case, for instance, of the REACH and CLP regulations in Europe, which require the industries to carry out the research to demonstrate that their chemicals are safe, and leave to the government only the role to verify the correctness and soundness of the assessment.

3. Beside the regulatory and assessment aspects, several industries have already often adopted voluntary schemes to reduce the environmental impact associated with their products and their production processes. Approaches like the Green Chemistry principle in manufacturing, Green Labeling, LCA assessment of products and processes, are all adopted by the most farsighted industries and, in most cases, demonstrated that they can associate a reduced environmental footprint with a more effective and efficient manufacturing and better access to local and international markets.

4. In this sense, the Stockholm Convention is providing indication as to what chemicals have been globally recognized as dangerous for the environment and, therefore, should be phased out. Therefore, any “green manufacturing” approach finds in the list of POPs the minimum requirements to ensure that the manufacturing processes are safe; this has however to be coupled with a number of more ambitious standards and processes aimed at reducing the generation of waste and the use of renewable resources, promoting the reuse or recycle of excess materials and waste, reduce the consumption of natural resources, minimize the release of pollutants in the environment.

5. Currently, the Stockholm Convention lists a number of POPs which may be considered as “industrial POPs” as they have been or are still used in industrial processes, including recycling of waste materials. Based on the last amendment of the Stockholm Convention (as of 24/03/2020), POPs classified as

“industrial” (1) are:

commercial PBDE mixtures (c-deca, c-tetra, c-penta, c-hexa and c-hepta BDE);

- Hexabromobiphenyl;
- Hexabromocyclododecane;
- Hexachlorobenzene;
- Hexachlorobutadiene;
- Pentachlorobenzene;
- PFOS and PFOAs;
- Short Chain Chlorinated Paraffins (SCCP);
- PCBs

6. With the exception of PFOS, (listed under annex B) all these chemicals are listed under annex A of the Stockholm Convention (elimination) and should therefore be phased out from any industrial process.

7. For some POPs, one of the main issues in preventing their use in industry is, however, that in most cases, they are placed on the market, with several commercial names. Moreover, these chemicals may be sold as mixtures, in which they represent only one of the components. Therefore, it may happen that industries are indeed even not aware that the chemicals they use may contain POPs.

8. This is the case, for instance, of the several brominated flame retardants classified as POPs, like the HBCDD, which is marketed with at least 40 different names; or the SCCP mixtures, which may contain tenths of different POPs chemicals and are sold with not less than 60 different commercial names<sup>[1]</sup>

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[1] Non-exhaustive list of trade names for SCCP: A 70 (wax); Adekacizer E 410; Adekacizer E 450; Adekacizer E 470; ADK Cizer 450; ADK Cizer 470; ADK Cizer E 410; Aquamix 108; Arubren; Arubren CP; Cerechlor 54; Cerechlor; Cerechlor 30; Cerechlor 42; Cerechlor 48; Cerechlor 50LV; Cerechlor 51L; Cerechlor 52; Cerechlor 54; Cerechlor 56L; Cerechlor 63L; Cerechlor 65L; Cerechlor 70; Cerechlor 70L; Cerechlor S 42; Cerechlor S52; Cerechlor S70; Chlorcosane; Chlorez 700; Chlorez 700hmp; Chlorinated paraffin; Chlorinated paraffin waxes; Chlorinated paraffin waxes and Hydrocarbon waxes; Chlorinated paraffins; Chlorinated paraffins (C23,43 chlorine); Chlorinated wax; Chlorinated waxes; Chloroflo 35; Chloroflo 40; Chloroflo 42; Chloroparaffine 40G; Chlorowax; Chlorowax 170; Chlorowax 40-40; Chlorowax 45AO; Chlorowax 50; Chlorowax 500C; Chlorowax 70; Chlorowax 70-5; Chlorowax 70S; Chlorowax S 70; Clorafin; Crechlor S 45; Crechlor S 45; EC 264-150-0; EINECS 264-150-0; Flexchlor; HSDB 4214; NCI-C53587; Paraffin wax, chlorinated; Paraffin waxes and hydrocarbon waxes, chlorinated; Paraffin, chlorinated; Paroil chlorez; Unichlor; Unichlor 50.

Non-exhaustive list of trade names for HBCDD: BRE 5300, Bromkal 73-6CD, CD 75, CD 75P, Cyclododecane, hexabromo, Dead Sea Bromine Group Compacted FR 1206 I-CM, Dead Sea Bromine Group Ground FR 1206 I-LM, Dead Sea Bromine Group Standard FR 1206 I-LM, FR 104, FR 1206ILM, FR-CD, Great Lakes CD-75, Great Lakes CD75PC (compacted), Great Lakes CD-75P™, Great Lakes CD75XF, HBCD, HBCD-LM, HBCD-LMS, HBCD-SP 75, Hexabromocyclododecane, HP 900G, Myflam11645, Nicca Fi-None CG 1, NiccaFi-None TS 88, Nikkafainon CG 1 Pyroguard F 800, Pyroguard F 800, Pyroguard SR 103, Pyroguard SR 103A, Pyrovatex 3887, Saex HBCD VHM, Safron 5261, Saytex 6006L Flame Retardant, Saytex BCT-610, Saytex HBCD, Saytex HBCD-HM Powder, Saytex HBCD-LMFlame retardant, Saytex HBCD-SF, Saytex HP 900, Saytex HP 900G, Saytex HP-900P, SaytexHBCD-LM, SP 75, YM 88

9. Moreover, the situation of POPs use or release in the manufacturing industry is diverse, and is related not only to a specific sector, but also to the specific regulatory framework of each country. For instance, in countries where fire prevention policies requiring quite strict anti-flammability standards are in place, the import, manufacture and use of brominated flame retardants, including POPs, is more likely to occur.

10. Similarly, in countries where the import of hazardous chemicals and POPs is not properly enforced, the import of POP chemicals can still occur. Besides, there is quite a limited number of POPs which are still manufactured or used in industrial processes, like PFOS, PFOAs, some SCCP, HBCDD, whilst the production of the other POPs has ceased almost everywhere. However, large chemical industries manufacturing brominated or chlorinated POPs, like HBCDD or SCCP, need now to reconvert their production to non- POPs chemicals, with significant impact on the manufacturing chain downstream. The issue of POPs in industry may therefore be summarized as three folded:

- a) chemical industry still manufacturing POPs (like SCCP, PFOS/PFOAs, HBCD);
- b) manufacturing industry still importing and using POPs (including the limited amount of deca-BDE which may still be available, or PFOS, PFOAs, SCCP, HBCDD);
- c) or the presence of POPs in end of life materials which is recycled or reused in industrial processes (like HBCDD, c-PBDEs, PFOS, PFOAs).

#### ROOT CAUSES AND BARRIERS THAT NEED TO BE ADDRESSED

11. Based on the above, there are a number of causes that still hinder the complete removal of POPs from the manufacturing processes, which are also applicable to Philippines setting:

**a) The issue of the “end of pipe” approach.**

One general cause, which goes beyond the POPs issue, is the paradigm of governments doing the risk assessment of chemicals and industry to adapt their processes only when the risk assessment is completed. The process is generally too slow, and it occurred often (like in the case of deca-BDE) that when the industry has completed the replacement of POP chemicals with non-POP chemicals, the new substance previously considered as non-POP is eventually also classified as POP. The “Green Chemistry” approach, as well as the “Green Design” approach in manufacturing can be of help in identifying non-chemical alternatives to POPs, which are therefore intrinsically safe and not exposed to the risk of “re-classification”.

**b) The issue of POPs identification in chemical mixtures.**

A very common cause is the limited capacity of manufacturing firms – especially micro and small enterprises – to identify which are POPs or hazardous chemicals. This is further complicated by the fact that in the absence of specific rules on the classification and labeling of chemicals, product consisting or containing POPs may be not easily identified on the basis of their commercial names – which also lead to the complete failure of inventory approaches based only on questionnaires. This difficulty is not affecting only industries: in many situations where the customs authorities have not the knowledge or the capacity to identify POPs, products containing POPs may still be legally imported because the commercial name of the chemical / mixture is not on the “banned list”.

**c) The issue of POP quantification in waste materials.**

A number of technical issues also affect the capacity to identify the presence of industrial POPs in products or waste materials. For instance, there is not a simple analytical methodology that can allow the identification of PBDE, HCBDD or HBB in plastic materials or foam. Rapid testing is mostly based on the analysis of the bromine through handheld detectors, with significant limitation on the reliability of the testing and no possibility to distinguish between POP and non-POP brominated chemicals. Likewise, official laboratory analytical methods are either not available for all industrial POPs, or they are quite expensive, therefore they cannot be used as routine methods for the segregation of POP versus non-POP waste.

**d) Barriers to the Green manufacturing as an alternative approach to POP avoidance.**

In general, it is evident that POP avoidance in industrial manufacturing cannot be based only on the classical approach, based on

- i) chemical identification of POP in waste or in product and,
- ii) identification of chemical alternative (or segregation of POP containing waste).

12. Moreover, the effective phasing out of POPs must be based more on the knowledge of processes and sources, by prioritizing processes and source of materials which are intrinsically safe, rather than acting only when POPs are identified in the process / material through a certified analytical method. It is, for instance, well known that hard chrome plating based on CrVI, or the chrome plating of plastic parts, required quite an intensive use of PFOS as detergent and mist suppressant. The approach can therefore be either to find a chemical alternative to PFOS in CrVI processes or instead change the process to a CrIII one, which is intrinsically safer and does not require at all the use of a mist suppressant. This is for instance the approach adopted in one of the pilot enterprises which has partnered the GEF/UNDP Green Chemistry project in Vietnam, with the immediate avoidance of a very large amount of PFOS (and CrVI) in their manufacturing process.

**The manufacturing sector in the Philippines.**

13. With a GDP of 330,910 billion USD, and a GDP/capita of 3,102 USD, Philippines ranks 5th and 6th among the ASEAN countries, ahead of Vietnam, Myanmar, Cambodia and Lao PDR. As of the 3rd Quarter of 2017, the manufacturing industry contributed to 23.1% of total GDP in the Philippines. In 2017, the Chemicals and Chemicals products industry ranked as 3rd in the GDP contribution. Notably, non-metallic and basic metal industries would be ranked fourth if grouped together. The table 1, below, shows the 10 largest manufacturing sectors in Philippines, ranked by their contribution to the GDP.

Table 1 – Largest Sectors of the Philippines, as per contribution to GDP (selected years).

Sector	2012	2016	2017*
Food manufactures	8.43	8.03	7.45
Radio, television and communication equipment and apparatus	3.78	3.76	4.41
Chemical & chemical products	1.51	2.99	2.59
Furniture and fixtures	0.85	1.11	1.09
Beverage industries	0.96	0.98	0.88
Basic metal industries	0.33	0.61	0.76
Petroleum and other fuel products	0.77	0.61	0.60
Non-metallic mineral products	0.60	0.52	0.56
Electrical machinery and apparatus	0.57	0.52	0.55
Machinery and equipment except electrical	0.32	0.48	0.51

\*as of 3rd quarter 2017 data only

14. Among these sectors, some have been identified as being characterized by a larger environmental impact. In 2015, an initiative promoted by the Philippine Board of Investment on Greening the Philippine Industry<sup>[2]</sup> identified Copper, Plastic, Paper, Furniture and Automotive as the five sectors for which a roadmap toward sustainability had to be implemented. Roadmap were developed by the BOI for these sectors. An updated of the activities and the status for some of these sectors was provided by BOI in February 2018.

<sup>[2]</sup> DTI/BOI. The Philippine Manufacturing Industry Roadmap For Sustainable & Inclusive Growth. Rafaelita M. Aldaba Department of Trade & Industry Board of Investments 7August 2015, BOI Building Makati City.

### POPs and manufacturing industry in the Philippines

#### Environmental aspects of key manufacturing sectors in the Philippines: Non-ferrous metal: copper.

15. The Philippines is one of the countries with vast amounts of mineral resources, including large reserves of metallic and non-metallic minerals such as gold, nickel, iron, copper, limestone, and marble. Among the metallic minerals, the largest reserve is copper, which is estimated at 4 billion MT, making the Philippines the fourth largest country in the world in terms of copper reserves.

16. There are eight products in the Philippines that define the copper industry. These are copper and ore concentrates; unrefined copper/anodes; refined copper and alloys which include cathodes; cast rods, bars and profiles; copper wires; plates, sheets, and strips; copper foil; and tube or pipe fittings.

17. There is high demand for copper products coming from Philippine industries, particularly electronics and automotive parts manufacturing. Electronics production makes use of copper foils, while automotive parts manufacturers utilize copper in automotive wires and harnesses. The industry also has linkages with metal fabrication (cutlery, hand tools, general hardware; metal containers), the manufacture of non-electrical machinery (metal and wood-working machinery; and pumps, compressors, blowers and air conditioners), non-ferrous foundries, and the manufacturing of transport equipment and land transport services.

#### **Environmental concerns associated with the copper industry.**

18. On March 24, 1996, the drainage tunnels of Marcopper Mining Corporation's open pit ruptured and spilled millions of tons of mine waste that smothered the Boac River in Marinduque, inundating villages and basically killing the life in the Boac River, which is still a dead river. 20,000 people had to resettle due to the accident (<https://www.rappler.com/move-ph/issues/disasters/165051-look-back-1996-marcopper-mining-disaster>)

19. The Marcopper mining disaster led to significant changes in the government's mining policies. The disaster prompted government to revise the rules of the Mining Act to focus more on the protection of the environment and address social issues. Higher standards for rehabilitation were set and stronger provisions on no-go areas were put into place. Consultations with local governments and indigenous communities also became a priority.

20. In 2012, another incident affected the mining industry in the country. The incident occurred at the Padcal mine, when a series of mine tailings spills occurred from August 2012 until September, from Tailings Pond 3 of the Philex Mining Corporation's Padcal mine in Benguet Province, Philippines.

21. The incident began with a massive release on the order of 5 million tonnes or 3 million cubic metres of water and tailings from a breached drainage tunnel (Penstock A) in the pond. The effluent flowed into the Balog River down to Agno River and San Roque Dam.[2] At least four more major discharges were reported: on August 4, 11, and 30, and September 13. The total weight of solids discharged is given by Advocates of Science and Technology for the People, citing a Mines and Geosciences Bureau Report dated Sept. 17, 2012, as 21 million tonnes. The Center for Science in Public Participation gives the volume discharged, for an incident which they date as August 2, but likely refers to the whole August-September series, as 13 million cubic metres.

22. Because of the above accidents, which apparently were only the greatest among a number of environmental releases caused by the mining industry, there is still a strong anti-mining sentiment in some groups in the country as well as in local administrators.

23. Recently, OceanaGold suspends Didipio mine operations (copper and gold) in Philippines amid dispute with the government. The mid-tier miner had sought renewal of its 25-year operating licence for Didipio in Nueva Vizcaya province last year, ahead of its expiry earlier this year, but the local government wants the mine shut due to environmental concerns [3].

[3](<https://www.reuters.com/article/oceanagold-outlook/update-1-oceanagold-suspends-didipio-mine-operations-in-philippines-amid-dispute-idUSL3N2702N4>)



24. As a consequence of the above, the copper mining in the Philippines has substantially downsized, and currently produces copper concentrates in an amount which is not sufficient for the internal manufacturing demand. To satisfy the internal demands, Philippines now imports copper concentrate from abroad together with cathodes and raw material, and use that material to manufacture cathodes (through smelting), rods, wire and cables (through casting), as well as foils. The production of such commodities is estimated to have contributed 9.74 billion pesos in 2011.

25. The Philippine Associated Smelting and Refining Corporation (PASAR), which is a key player in the copper industry, has an annual demand of copper concentrates 720,000 MT, which is met through importation of copper concentrates given that local production of such inputs remains insufficient. The industry provides jobs for 7,300 Filipinos, with PASAR employing 1,000 workers.

26. Studies have indicated that UPOPs emissions from secondary copper smelters are higher than those from primary copper smelters, iron foundries and secondary aluminium smelters. PCDD is not only released in the production workplace during the secondary copper production process, but throughout the environment, including ambient air, soil and the environment. The NIP updated carried out in 2014 however did not analyze separately copper from the general ferrous and non-ferrous metal sectors, which totally accounted for around 10.5 gTeq/yr. Considering that the demand for copper concentrate in the Philippine is in the order

27. Based on the BOI reports, Philippines will have a fully integrated copper industry from mining to manufacturing by the end of 2030. There will be the need to develop both downstream and upstream industries. The contribution to the GDP should increase up to around 2% in 2030.

28. On January 31, 2019, the Philippines Board of Investment announced the development of the Masterplan for the Leyte Ecological Industrial Zone (LEIZ). The main objective of the masterplan is to attract more investors and businesses to locate in Leyte, jumpstarting the revival of economic activities in the area and provide more employment opportunities.

29. The development of the LEIZ Masterplan is one of the action items under the Copper Industry Roadmap whose objective is to develop a copper industry cluster, preferably in Leyte, which may be supported through the establishment of an ecological industrial zone.

30. Government stakeholders in Region VIII and Leyte expressed their support to this project. As part of Palafox Associates' work plan, there will be series of consultations with local stakeholders in the formulation of the Master Plan.

31. The roadmap was crafted by the industry stakeholders themselves back in 2012 with the guidance of the BOI as part of its Industry Development Program. It aims to promote the integrated development and competitiveness of copper and other related industries in the region. It is also part of the government's continuous rehabilitation efforts in the region after the devastation of typhoon Yolanda.

#### **Environmental aspects of key manufacturing sectors in the Philippines: steel plating**

32. PFOS. Based on "The Philippine Electroplating Study (MIRDC 2015) ", a survey carried out on the electroplating sector revealed that in the Philippines there are at least 20 hard-chrome plating factories and 18 Cu-Ni-Cr plating factories. As the survey was based on questionnaire, it's likely that the survey underestimated the real picture. As reported in the study "Most respondents who declined to participate in the study are those belonging to largescale manufacturing industry. The figures cited in this study, therefore, reflect those provided by micro, small and medium enterprises (MSMEs)."

33. In the Philippines, many industries including automotive, electronics, hardware, appliances, telecommunications, jewelry and the aerospace industry have electroplating operations in their manufacturing processes. Most electroplating businesses are categorized as micro and small enterprise and are mostly under single proprietorship. The electroplating industry comprises only 4% of the metalworking sector in the Philippines Its significance, however, cannot be

understated as it also brings invaluable contribution as a catalyst of the economy's development. (MIRDC, 2013).

34. Similarly to other developing countries, in the Philippines chrome-plating facilities are often located in urban areas. Small chrome plating facilities does not have suitable plants for the treatment of the exhaust bathing water, which is usually released in the environment, in the best cases, after a neutralization step. The hexavalent chromium and other chemicals, including PFOS, when released through wastewater disposal may expose nearby residents, resulting in an increase in cancer rate.

35. Indeed, as a result of the survey carried out in 2015 by MIRDC, electroplating industries placed the issue of waste management as one of the key aspects, soon after the need to improve quality control and assurance (QC/QA). The study concludes that "Two issues that need to be carefully resolved are... those related to the lack of waste water treatment facilities and rigid price competition" and "It pays to keep watch of the country's neighbors and learn from their best practices. For instance, developments undertaken by the electroplating industries of countries with more advanced facilities are leaning toward the protection of the environment and saving energy while they carry out measures to adapt to modern demands. The local electroplating industry may pattern its strategies for longer-term planning after these countries, because apparently, an environment-friendly and energy-efficient kind of development is the direction that the local electroplating industry should go."

36. Moreover, it is well known that alternative to PFOS as detergent and mist suppressant in CrVI-based hard-chrome plating process have not been fully identified yet, whilst the replacement of CrVI with CrIII process allow to achieve the double benefit of avoiding both CrVI (which is carcinogenic) and PFOS.

#### Environmental aspects of key manufacturing sectors in the Philippines: paint manufacturing.

37. The Philippine Association of Paint Manufacturers covers 72 large enterprises., and has estimated total capacity of the paint manufacturers is approximately equivalent to 250 million liter per annum.

38. In general, the impact associated with paint manufacturing and use is linked to the use of solvents, monomers, softening agents, and biocides which are among the substances in these products representing a risk for human health and the environment. As paint are classified as "open use" chemicals, i.e. chemicals which use does not envisage any containment but which are instead applied to surfaces to which people can be directly exposed, the presence of any toxic chemical in paint results in the exposure of people or release in the environment.

39. One of the main uses of Short Chain Chlorinated Paraffins is in chlorine-based paints For the coating consumption in the Philippines, 50% is solvent-based, 48% is water- based and the remaining 2% other coatings. There are no figures concerning the production of chlorine-based paints, however, it is known that some of the major paint manufacturers in the country produce this type of paint. Alternative to SCCP in paint manufacturing indeed exists. However, due to the lower cost of SCCP process compared to process based on alternatives, in the absence of specific rules (national or international standard as required by the law or by the need to comply to client's requirements), the industry is more likely to use SCCP rather than alternatives in chlorine-rubber paints.

40. Notably, in the Philippines, there is not yet a standard forbidding the use of SCCP in paint manufacture, although all types of lead-containing paints in the Philippines have been ordered for phasing-out. Effective January 1, 2020, the country's paint and coating industry transitions to a full non-lead production of paints used for industrial applications with the completion of the phase-out period. This is in compliance to the DENR Administrative Order 2013-24, or the Chemical Control Order for Lead and Lead Compounds. Lead-containing architectural, household and decorative paints were phased out at an earlier time on December 31, 2016.

41. Environmental issues associated with the furniture industry, including the use of chemicals. Based on a report from BOI, the majority of manufacturers in the furniture sectors are small enterprises dealing with small volume orders, with good artisanship and craftsmanship and a quite modern design. The industry uses mostly wood as raw material (rattan and buri wood), metal stone craft, bamboo and plastic.

42. The process of manufacturing entails all the stages of wood pretreatment, cutting, assembling and finishing. The strategic vision for the industry by 2030 is that it shall be the global design innovator or hub for products using sustainable materials with thriving domestic and international markets and a competitive and motivated labor force. Goals mentioned in the roadmap of the furniture sectors which are particularly relevant for this project are:

- a. "To upgrade design education through early introduction of design awareness appreciation and information and training assistance for design students and professional designers and manufacturers.
- b. To establish sustainable and environment-friendly raw materials, discover new raw materials that are available the whole year, and establish supply hubs for semi-processed and raw materials from local sources and from other countries
- c. To develop/ innovate waste materials"

43. Most manufacturers in the Philippine Furniture industry is utilizing a basic furniture technology directed towards small volume orders and not for mass production. Strength of the industry remains in manual labor with good artisanship and craftsmanship applied in modern designs.

44. Innovation in the use of indigenous materials is initiated by the private sector in partnership with local designers as well as the Design Center of the Philippines. Suppliers of raw materials are basically located in Quezon, Iligan, Davao, Bicol, Bohol, Butuan, Tuguegarao, etc. Some manufacturers are already importing wood materials due to the problem in the sourcing of wood in the Philippines. The industry is linked with various government agencies in the research and sourcing of raw materials and trainings including with the following:

- a. Department of Science and Technology (DOST) and affiliated agencies
- b. Department of Environment and Natural Resources;
- c. Department of Trade and Industry and affiliated agencies;
- d. Technical Education and Skill Development Authorities.
- e. Environmental aspects of the furniture sector are mostly linked to biodiversity and forest preservation; use of chemicals in the industry; POPs in the furniture sector. Although furniture is not a chemically intensive sector, a number of POPs may be used / may have been used in several manufacturing processes.

#### **Environmental issues associated with paper making in the Philippines.**

45. Based on information provided by the Philippine Paper Manufacturers Association, (Greening the Roadmap for the Philippine pulp and paper industry) in the Philippines the local paper production is 95% based on recycled wastepaper; local mills use 0.9 Million Tons/yr local wastepaper, preventing this volume of solid wastes from ending up in landfills. The 6 biggest mills have complete wastewater treatment plants and operate modern air pollution control systems; however the other paper mills have primary wastewater treatment and basic air pollution control devices. Some 2/3 further treat wastewater up to biological and tertiary treatment stages and the balance are in various levels of completing their wastewater treatment systems. The industry (PPMAI) signed an

Environmental Consent Agreement (ECONA) with EMB under the Environmental Partnership Program (PEPP) and is taking further steps to comply fully and consistently with the conditions set by DENR under DAO 14-2003. •These measures include sustaining efforts to comply with the terms of ECONA for the Clean Water and Clean Air Acts and with other Environmental laws under the Med-Term Phil. Developmental Plan (PDP), such as Solid Waste Management Act (RA 9003), Hazardous and Toxic Waste Substances (RA 6969), and PDEA/PNP Regulations on the import and Handling of Controlled Chemicals and Substances.

46. The pulp and paper sector however still needs to raise wastepaper recovery from current 50-55% to 65% in 3-5 years. this will bring back to recycling an additional volume of 150-200,000 tons/yr wastepaper that would otherwise end up in landfills; further raise wastepaper recovery rate from 65% to at least 70% in another 6-10 years; the Kraft pulpmill shall adapt to modern and environmentally-friendly technologies in wood fiber pulping, bleaching and water use. its steam/power generation shall be only biomass and waste heat-based. it shall be compliant with all iso standards defining quality, production, environmental care, health protection and safety.

47. Environmental issues associated with the plastic, industry, including use of PBDEs. Based on the information provided by PPIA in 2014 the majority of the local plastic manufacturers are situated in the National Capital Region (NCR) with 642 firms and generating some 26,609 jobs. That is followed by CALABARZON area with 176 firms with 17,012 generated employment, Central Luzon with 87 firms with 5,287 jobs; Central Visayas with 87 firms with 2,751 jobs; Northern Mindanao and Davao regions registered 68 firms with 3,231 jobs.

48. Some large domestic plastic companies are engaged in the production of plastic motor-vehicle parts and components for Toyota, Mitsubishi and Isuzu. Some are engaged in shipbuilding through fabricated glass.

49. Most micro and small plastic firms are engaged in the production of plastic packaging such as the plastic bags, or are engaged in informal waste recycling.

50. Differently from PFOS and SCCP, it is unlikely that PBDE substances are still used in the manufacturing of products in the Philippines. The government has already set standards related to the maximum allowable concentration of PBDE in products, in line with the European ROHS directive (1,000 ppm). The use of C-penta BDE and C-Octa BDE mixtures already ceased around 10 years ago, whilst the use of C-decaBDE ceased in 2017. There is, however, quite a high probability of finding C-decaBDE in plastic or foam items manufactured until 2017 which, by their function, must ensure flame retardant properties. Therefore, the issue of PBDE is more on the side of waste characterization, segregation and management.

51. The United Nations Industrial Development Organization (UNIDO) is taking care of the segregation of plastic components of e-wastes possibly contaminated with Polybrominated diphenyl ethers (PBDEs) with the Integrated Recycling Industries (IRI), which was selected as facility partner for the project "Implementation of PCB Management Programmes for Electric Cooperatives and Safe e-waste Management".

52. IRI will segregate plastic components of e-waste possibly contaminated with PBDEs. Representative plastic samples with elevated concentrations of bromine are being analyzed to determine the particular PBDE congeners that are present. PBDE-contaminated plastics will eventually be disposed through co-processing in cement kilns to prevent them from re-entering the recycling stream, thus averting secondary contamination.

53. UOPs and Waste Management. The results of the Third National PCDD/PCDF Inventory for the Philippines (which reported upon the updated and reviewed 2014 NIP) estimated a release of 780 g TEQ/a of PCDD/PCDF in 2010. It identified open burning and disposal/landfills processes as the two major sources of these emissions that were contributing to 56 and 32 percent of the total releases respectively. Previous inventories made in 2003 and 2006 also

showed these two sources as the major contributors. The 2010 inventory identified other significant sources such as ferrous and non-ferrous metal production at 31.3 g TEQ/a, power generation and heating at 24.5 g TEQ/a and production and use of chemicals and consumer goods at 15.9 g TEQ/a. About 55.42 percent of the total emissions are released into the air while 34.24 percent end up in residues from physical and chemical processes.

54. Section 20 of RA 8749 bans the use of incineration for burning municipal, bio-medical, and hazardous waste, but allows the traditional method of small-scale community burning. Burning of plastics, which has been banned since 2001 with the implementation of RA 9003, produces chlorinated and brominated dibenzofurans and dioxins. In particular, concerns have been raised with respect to PVC plastics, which are commonly used to make pipes for water systems. PVC is also used in baby bottles, toys, food containers, and other everyday products. When burned, PVC plastics release harmful POPs dioxins and furans.

## THE BASELINE SCENARIO

### The inventory of POPs of industrial relevance in the Philippines

55. The National Implementation Plan of the Stockholm Convention in the Philippines has been updated in 2014 and is based on data up to the 2013 or earlier. For this reason, it does not contain inventories associated with all the POPs which have been listed under annex A or B of the Stockholm Convention after 2013, including deca-BDE, PFOAs, PCN, HCBDD, HCB, SCPP, Dicofol. Most of these substances are of industrial relevance, and it would be therefore necessary to update again the NIP taking into considerations these new POPs. Upon analysis of the results of the limited inventory of POPs as from the 2014 update, it is acknowledged that:

56. A comprehensive national inventory of PFOS is still lacking. There is no known production of PFOS in the Philippines. However, the country imports products that contain PFOS. PFOS estimates are thus based on volumes of imported articles for various industries based on the percentage of the total weight of PFOS of the imported articles. The highest PFOS equivalent weight of 345 tons was as estimated to be contained in imported chrome metal-plating pigments and preparations; 147 tons contained in synthetic carpets and fire resistant textiles; 33.6 tons contained in grease-proof and food paper; and 24.5 tons contained in fire-fighting substances and preparations.

57. A stakeholder consultation held during the preparation of the PIF revealed that most of the firefighting products imported are PFOS- and PFO- free, although the existence of stockpiles of old products containing PFOS cannot be completely excluded. The same consultation meeting, however, did not bring evidence of imports of PFOS linked to the metal plating sector.

58. PBDEs. As in the case of PFOS, a complete and comprehensive national inventory of PBDEs is still lacking. The overall amount of PBDE estimated in the updated NIP (which did not include deca-BDE) to be contained in e-waste has been estimated in the NIP at was 93.4 tons, whilst the amount associated with the transportation sector has been estimated at 24 tons, which comprises of 22 tons of c-pentaBDE contained in vehicles manufactured in the period 1990-2004, and 2 tons of c-pentaBDE in End-of-Life-Vehicles (ELVs).

59. Deca-PBDE has been applied in textile sector in a percentage ranging from 7.5% to 20%, whilst the concentration of deca-PBDE in various plastics has been assessed in the order of 10% to 15% (UK HSE, 2012). The use of PBDE has completely stopped in Europe since 2012. However, it was still ongoing in China until recently.

60. Based on a research carried out by Oeko Institute for ACEA (the European Association of Car Manufacturers), up to 2017, deca-BDE has been used in the manufacturing of specific car components (including cabling), in the 10-21% concentration range.

61. SAEFL (2003) estimates a content of 0.625 g/kg with respect to the total weight of plastics in cars exclusive of EE plastic components (switches, transformers, lighting appliances), whilst the Danish EPA estimates an average amount of 1 to 5 g of deca-PBDE for each car. The amount of plastic in car is around 5% to 20%. Adopting the SAEFL estimate, assuming an average weight of 1.5 tons for cars, the amount of deca-PBDE in each car would be from around 47 to 188 g.

62. Using the UNEP Guidance document for the inventory of PBDEs, the 2014 NIP conducted an initial assessment based on the cumulative Land Transport Office (LTO) vehicle registration from 1975-2004. The total number of 4.9 million vehicles contained approximately 22 tons of c-PBDE at the end of 2004. The estimated number of disposed vehicles (or ELVs) was 226,170 by the end of 2012. This translated into about 2 tons of c-PBDE. The quantities of tetraBDE, pentaBDE, hexaBDE and heptaBDE in ELVs were likewise estimated by government sources to be 661.26 kg, 1,162.22 kg, 160.3 kg and 10.02 kg, respectively.

63. Concerning deca-BDE, based on the figures provided by SAFL, the amount of deca-BDE would be in the order of 10.6 to 45.2 tons for the vehicle disposed in 2012. Updated figures need to be calculated.

### **Regulatory framework**

64. **Regulation on POPs.** The current regulation that controls the management of chemicals and their wastes is the DENR Administrative Order 29 Series of 1992, which requires the registration of chemicals that pose an unreasonable risk to public health, the workplace and the environment. However, of the 12 initial POPs in the SC, only three (3) are included in the Priority Chemicals List. These are PCBs, Mirex and Hexachlorobenzene.

65. Review and revision of related existing regulations and guidance is, therefore, needed to build national capacity to effectively manage and control other POPs. The Philippines government has indicated that the Environmental Management Bureau (EMB) and the Fertilizer and Pesticide Authority (FPA), were the only two agencies which have mainstreamed chemicals management in their budget allocations. Enhancing the country's capacity, requires a budget specifically allocated for POPs management so that POPs measures can be effectively implemented by concerned agencies. Further coordination and trainings are needed to aid stakeholders to enable them to issue their policy on POPs, to enhance their capacity to monitor POPs contamination and clean-up and remediate contaminated sites.

66. A national strategy for the proper management of PBDE-containing waste materials is still lacking. Knowledge resources related to PBDEs are still scattered, and there is a need to build capacity through further research, training and workshops on conducting inventories, monitoring, and undertaking material flow analyses concerning PBDEs.

67. The country's policy regarding recycling and reuse must be revisited and improved to incorporate focus on specific materials/products containing PBDEs and PFOS.

68. The Environmental Management Bureau (incl. laboratory staff) received various trainings on POPs management, including POPs identification, environmental audits, management planning for POPs, and analysis of POPs, but these trainings did not focus on PFOS and PBDE.

69. Although trainings have already been conducted on POPs analysis, there is still a lack of sampling and analysis protocols for PBDE and PFOS as well as standard procedures for estimating POPs in relevant industries. This component aims to strengthen the capability of EMB laboratory division on POPs analysis.

70. **GHS.** In the Philippines, GHS was implemented in the workplace through the "Guidelines for the Implementation of Global Harmonised System (GHS) in Chemical Safety Program in the Workplace" issued in 2014. Also, the Department of Environment and Natural Resources (DENR) administrative Order No. 2015-09 GHS Guidance Manual was released to set a GHS classification criteria and set the basic requirements on GHS labelling and Safety Data Sheets (SDSs). SDS and labels are required for hazardous substances and mixtures beginning March 14, 2015. All chemical importers, manufacturers, suppliers and distributors shall submit 16-sections SDS and labels when securing for permits, licenses, clearances and certification using the GHS format together with a notarized covering letter. SDS and labels submitted are screened by a Chemical Management staff and reviewed and verified by the GHS Review Committee.

71. DENR also set different timelines for substances subject to Chemical Control Orders (CCO) and substances on Priority Chemicals List (PCL) as:

- single substances and compounds in CCO and PCL – 2016.
- high volume toxic chemicals – 2017; t
- toxic chemicals under IATA and IMDG list of dangerous goods – 2018; and
- mixtures – 2019.

72. **PRTR.** In 2017, House Bill No. 6225 An Act Creating a Philippine Pollutant Release and Transfer Registry was introduced during the 17th Congress. This testifies the effort of the government in the establishment of such a system. However, no approval has been seen to date. Philippines is not in the OECD's list of adherents to the establishment and implementation of a Pollutant Release and Transfer Register (PRTR).

#### **Climate Change Profile of the Philippines:**

73. In the Philippines, the historic climate trends include and increase average temperature of 0.65°C from 1951–2010, with associated increased number of "hot" days and decreased number of "cold nights" from 1951–2010. Sea level rise of 0.15meters since 1940. Projections to 2050 envisage an increased temperature of 1.8 to 2.2 °C; reduced rainfall from March to May; increased heavy and extreme rainfall in Luzon and Visayas during the southwest monsoon, making the wet season wetter, but decreasing rainfall trends for most of Mindanao. Increased frequency of extreme weather events, including days exceeding 35°C, days with less than 2.5mm of rain, and days exceeding 300mm of rain (source: USAID)

74. The climate change will impact mostly the agricultural sector, and will negatively affect the availability of water resources and energy, as well as urban infrastructures. Although the manufacturing industry is not the one facing the higher risk associated to climate change, factories and infrastructures located near landslide-prone areas or near coastal areas are obviously also facing a significant risk. (GFDRR – Global Facility for Disaster Reduction and Recovery)

75. In terms of climate change effect, no activities / infrastructures will be built that could be impacted by climate change in the long term. The project will mainly work by promoting POPs free technologies, processes and materials, and by improving the environmental performance of existing plants. The resilience of these plants to possible effect due to climate change will be one of the selection criteria. For instance, the project would not invest in area prone to flooding.

76. Technology and materials developed under the project to replace POPs chemicals and minimize the use or generation of POPs will be also assessed in terms of potential increase or decrease of energy consumption and release of GHG throughout their entire lifecycle.
77. Although the manufacturing sector, based on the Philippine climate change profile, is not among the sectors associated with the higher climate change risk, there is anyway a projected risk associated to the impact on water and energy resources, as well as climate change risk associated to infrastructures located near landslide-prone areas or coastal areas.
78. UNDP Pre-SESP Procedure identified a moderate risk of significant consumption of energy and causes significant greenhouse gas emissions. The chemicals industry consumes relatively high quantity of energy in the production process, resulting in high level of greenhouse gases emitted. In this regard, the project aims to support the industries to use BAT/BEP to improve chemicals processing that could also bring co-benefit of improved energy efficiency. At PPG stage, plans for climate change risk assessment and mitigation measures will be described in detail, and a climate risk assessment carried out.

## ASSOCIATED BASELINE PROJECT

### Current Efforts to Combat Chemicals Management Issues

79. There are various noteworthy efforts undertaken by the government and private sector actors to address the issues, concerns and demands for plastics:

a) Sustainable copper industry: On January 31, 2019, the Philippines Board of Investment announced the development of the Masterplan for the Leyte Ecological Industrial Zone (LEIZ). The main objective of the masterplan is to attract more investors and businesses to locate in Leyte, jumpstarting the revival of economic activities in the area and provide more employment opportunities. The development of the LEIZ Masterplan is one of the action items under the Copper Industry Roadmap whose objective is to develop a copper industry cluster, preferably in Leyte, which may be supported through the establishment of an ecological industrial zone. Government stakeholders in Region VIII and Leyte expressed their support to this project. As part of Palafox Associates' work plan, there will be series of consultations with local stakeholders in the formulation of the Master Plan.

b) Sustainable chemical industry. The JG Summit Olefins Corporation (JGSOC) Naphtha Cracker Plant in the Philippines started its commercial operations on November 1, 2014 to produce polyethylene (PE) and polypropylene (PP) resins, for sale to both domestic and export markets. The JGSOC can include monitoring for the presence of PBDE in their resins as part of Quality Assurance/Quality Control (QA/QC) and Safety Data Sheets (SDS). This can be verified through DENR and the Bureau of Philippines Standards (BPS), of the Department of Trade and Industry (DTI). This may control the influx of imported plastics with PBDEs and PFOS.

c) Greening the Industry Roadmaps. In the 2nd Scoping Mission for the "Greening the Industry Roadmaps" project implemented by GIZ. In 2015, an initiative promoted by the Philippine Board of Investment on Greening the Philippine Industry identified Copper, Plastic, Paper, Furniture and Automotive as the five sectors for which a roadmap toward sustainability had to be implemented. Roadmaps were developed by the BOI for these sectors. An update of the activities and the status for some of these sectors was provided by BOI in February 2018.

d) DOST-ITDI (2017) has developed a biodegradable substitute to synthetic plastics using nanoclay pellets – a cornstarch-based raw material. This biodegradable polymer has its component validated in the laboratory and is being assessed for cost and investment prospects.



e) Plastic Bank (2016) has set up a pilot recycling ecosystem in the Philippines. Residents collect plastic from their environment and bring it to a local Plastic Bank branch in exchange for money, fresh food, clean water, cellular service, cooking oil, or even school tuition for their children. Collectors are paid a Social Plastic premium in addition to the market plastic value, which ensures a stable, livable income. To expand the Plastic Bank Ecosystems in the Philippines, Plastic bank partnered with SC Johnson, Danone, ALDI, Greiner, and Eat Natural. To date, the Plastic Bank Ecosystem now has 43+ branches, engaged 1500+ collectors, with collection amount of 200,000 kg of plastic per month.

f) The Philippine Alliance for Recycling and Materials Sustainability (PARMS), in partnership with the local government, launched a Php 25-M residual plastic recycling facility in Parañaque. Plastic wastes collected are turned into eco-bricks or recycled building bricks. PARMS is an alliance of major corporations and business groups in the Philippines such as Mondelez Philippines, Coca-Cola Philippines, Pepsi-Cola Products Philippines, Unilever, Universal Robina Corp., Nestlé Philippines, Monde Nissin Corp., and Procter & Gamble Philippines, among others.

g) Activated carbon treatment is among the best available techniques (BATs) for removal of chemicals from secondary copper smelter off-gases. Activated carbon possesses a large surface area on which PCDD/PCDF can be adsorbed. Off-gases can be treated with activated carbon using fixed or moving bed reactors, or by injection of carbon particulate into the gas stream followed by removal as a filter dust using high-efficiency dust removal systems such as fabric filters. In 2016, the Philippine Coconut Authority (PCA) reported a growing number of 16 activated carbon manufacturers in the country. Their raw materials used are mainly from coconut wastes. Armonio *et al.* (2018) also produced activated carbon using corn cobs and mango kernels *via* H3PO4 activation and hydrothermal treatment[1]. Ocreto *et al.* (2019) developed a modified activated carbon using bamboo. Both studies focused on applications for Cu, Ni and Pb removal in aqueous solution[2].

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[1] <https://doi.org/10.1051/mateconf/201926806020>

[2] <https://doi.org/10.1051/mateconf/201926806021>

## THE PROPOSED ALTERNATIVE SCENARIO WITH A BRIEF DESCRIPTION OF EXPECTED OUTCOMES AND COMPONENTS OF THE PROJECT

### Project strategy and Theory of Change (TOC)

80. The project intends to address the intentional or secondary contamination of POPs (PBDEs, PFOS, PFOA, HBCD, SCCP) paint, chrome plating, non ferrous metal, plastic recycling and other related sectors, with the general objective to protect human health and the environment.

a. **BASELINE:** The baseline situation, and the baseline projects, as already reported in detail in Part II of this document, and more specifically, under the sections “The Global Environmental and Adaptation Problems”, “The manufacturing sectors in the Philippines”, “POPs and manufacturing sector in the Philippines”, “The Baseline Scenario”, “Regulatory Framework” and “Associated baseline projects”, can be summarized as from the following statements:

- The manufacturing sector has still a reduced environmental awareness, and operates with a significant environmental impact;
- The awareness concerning POPs and Green Chemistry is low. No ban against new POPs is in place;
- Previous industrial accidents and workplace exposure caused environmental impacts and a negative sentiment against industry;

- The National Implementation Plan need to be updated with the POPs listed under the SC after 2013;
- A plan for the roadmap toward sustainability of manufacturing industry has been developed in 2015 by BOI, but it has not been implemented;
- Some existing international cooperation projects (like the SWITCH program (EU) and the GIZ projects on sustainability roadmaps, as well example of existing Green Funds) have been implemented or are in the course of implementation.
- Some existing initiatives (like the ones on “Sustainable copper industry”, “Sustainable chemical industries”, “Plastic Bank” which may integrate project activities, are in place.

b. **STAKEHOLDERS:** A detailed list of stakeholders is reported in page 38 of this project. From a general perspective, the above aspects are of interest of the following stakeholders categories, which are either impacted or caused the existing baseline, and which may have a role in the improvement of the baseline through the execution of the project:

- The general public and consumers;
- Workers in the manufacturing sector;
- The government, and more specifically, DENR and DTI
- International donors and agencies, financial institutions
- Customs
- Recyclers

c. **RISK/BARRIERS:** The following barriers will be overcome by the project:

- The issue of the “end of pipe” approach. The “Green Chemistry” approach, as well as the “Green Design” approach in manufacturing can be of help in proactively identifying non-chemical alternatives to POPs, which are therefore intrinsically safe and not exposed to the risk of “re-classification” only after a chemical has been classified as hazardous (end of pipe).
- The issue of POPs identification in chemical mixtures. The project will provide knowledge and practical trainings to customs and manufacturing firms to identify which, among the substances they are using or checking, are POPs or hazardous chemicals.
- The issue of POP quantification in waste materials. A number of technical issues also affect the capacity to identify the presence of industrial POPs in products or waste materials. The project will provide training on methodologies (including rapid testing or tracing methods) that can allow the identification of PBDE, HCBDD or HBB in plastic materials or foam.
- Barriers to the Green manufacturing as an alternative approach to POP avoidance. The project will implement activities allowing for the effective phasing out of POPs through the knowledge of processes and sources, by prioritizing processes and source of materials which are intrinsically safe, rather than acting only when POPs are identified in the process / material through a certified analytical method.

d. **INPUTS:** Through the implementation of the project, inputs consisting in technical assistance, knowledge sharing, financial contribution (grants from the GEF and from Philippines institutions, in kind co-financing), technology and equipment, legal assistance to update relevant regulations will be provided. These inputs will allow:

- To address the issue of limited knowledge of the use and release of new POPs in industry, will update the National Implementation Plan of the Stockholm Convention. This will allow to gather information on the use and release of POPs and new POPs and establish priorities, with specific reference to POPs in the industrial sector.
- To address the issue of limited willingness of specific manufacturing sector in investing to improve their environmental foot-print, will establish a Green Financing mechanism supported by training on Green Chemistry and its impact on circular economy and strengthened by proper eligibility criteria compliant with the Stockholm Convention and the project objectives; special Green Financing funds will be designed and implemented to facilitate the access of micro/small enterprises. Gender mainstreaming and inclusiveness aspects will be included as mandatory criteria for access to funds.
- To ensure that the industries receiving support under the Green Financing mechanism will effectively implement Green Chemistry technologies and processes, will provide technical assistance and training to the implementation of such technologies and process, and will promote environmentally friendly design where the technical properties of POPs or other chemicals of concerns are not anymore needed as they are replaced by intrinsic properties of the products or the materials;
- To improve industries' environmental accountability and improve the trust of the public on the manufacturing industry, will pilot a PRTR system to facilitate the reporting of pollutant release and transfer by the industry and the access of environmental data to the public, including POPs.
- The project will support industrial initiatives aimed at the production of POPs free products with a green chemistry approach (which, especially with regards to criteria 1 (prevent waste), 4 (Design safer chemicals and products), 6. (Increase energy efficiency), 7(Use renewable feedstocks) and 10 (Design chemicals and products to degrade after use).

e. **ASSUMPTIONS** The above will be implemented based on the following assumptions:

General public seeking more transparency of environmental data

- Manufacturers interested to subscribe Green Loan and available to demonstrate GC and PRTR
- DENR and DTI can work in coordination toward the goal of sustainability
- Bilateral donors willing to sustain their previous efforts
- Financial institutions are interested in supporting FREEME
- Customs are interesting in partnering and receiving technical support from the project
- Recyclers willing to participated in training and other project activities

f. **ACTIVITIES/OUTPUTS:** The project will undertake the following activities:

- Updating of the NIP;
- Updating and enforcement of the POP downstream regulation;
- Design of a Green Chemistry Roadmap for the Philippines
- Design and implementation of a financial mechanism with a initial capital of 15 M USD to be disbursed as a loan under a competitive interest rate;
- PRTR designed and piloted

- Demonstration of GC with POPs, U-POPs and GHG reduction
- Training and supporting schemes for recyclers
- Technical guidance, training and roadmaps for Green Chemistry in specific sectors.
- Technical guidance for customs

**g. DESIRED RESULTS:**

- The implementation of the project will result in the complete phasing-out of PFOs and SCCP utilized in industrial manufacturing sectors covered by the project, which can be quantified – adopting a conservative approach – in half the amount of PFOS estimated in the NIP for the chrome plating sector, 10 tons of direct avoidance of PFOS from the demonstration and at least 10 tons of SCCP from the paint sector. Further reduction of other industrial POPs cannot be calculated at this stage, as it would be based on the PPG preliminary inventory.
- The implementation of the project will also ensure a better communication and sharing of environmental information among industry, the GoP and the public, with a greater transparency on the environmental impact of the manufacturing sector.
- The implementation of the FREEME green funds to support the shifting toward GC will result in a greened, sustainable and more competitive manufacturing. Through the implementation of the project, further closure of gender gaps and enhancement of the worker rights will be also leveraged.

**Table 2: Theory of Change (ToC) diagram.**

**Orange arrows: negative impact of existing barriers. Green arrows: project technical or financial contributions to solve existing barriers. Purple arrows: logical interconnections between project activities. Blue arrows: contributions from the stakeholders or assumptions**

Baseline	Root Causes / barriers	Assumptions	Project Inputs	Stakeholders	GEF Intervention	Project outputs	Desired results / GEB
No ban against new POPs is in place. Current regulation not compliant with post-2013 amendments of the SC.	"End of pipe approach". Lack of technical and financial resources.	DENR and DTI can work in coordination toward the goal of sustainability.	Technical assistance to update of the existing regulation to make it compliant with the SC.	Government, Regulators and Enforcement Officials	Project will collaborate to completely phase out the import, export and use of all new POPs which are currently directly or indirectly used in the industrial manufacturing.	1.1.3 1.1.4	POPs use and import completely banned.
Issues in enforcement the POPs related regulation, especially use and import/export and new POPs.	Lack of awareness. No rules or technical guidelines for preventing the import of POPs	Customs Authority is interested in partnering and receiving technical support from the project.	Capacity building of custom officers		This will also require technical support to the custom authority for the identification of chemicals, either as such or in products or mixtures, that may contain POPs and which should therefore be banned for import or export.		
The National Implementation Plan need to be updated with the POPs listed under the SC after 2013;	Other priorities and lack of resources have hindered the updated of the NIP after 2013.	DENR committed to implement the SC amendments and updated the NIP with the support from the GEF	Technical and financial assistance to update of the National Implementation Plan of the Stockholm Convention. The recent amendment to the SC are particularly relevant for the manufacturing sector	Government, regulators	The project intends to provide technical support for the second upgrade of the NIP, which will include inventory update of all the POPs already covered by the Stockholm Convention in 2013, plus the additional new POPs listed under the Convention Annexes up to 2020	1.1.1 1.1.2	Commitment to address current and future POPs issued through a sound planning process
Reduced environmental awareness, and significant environmental impact of the manufacturing industry. Some manufacturing sectors may still be using POPs in their process.	Lack of awareness, no proactive behavior of enterprises, financial and operational cost of the implementation of environmentally safe procedures including Green Chemistry.	Enterprises are interested to apply for Green Loan to undertake environmental investments and demonstrate GC and PRTR in their factories	Technical assistance, training and financial support for the implementation of GC technologies and processes, and to promote environmentally friendly and intrinsically safe design; financial and technical support for piloting GC in 4 factories.	Enterprises, private sector	The experience achieved through other GEF/UNDP project in the implementation of Green Chemistry in other ASEAN countries will be an asset in the implementation of the "Green Chemistry component" of this project for the implementation of the "Greening Roadmap" already started in 2015, which however did not materialize due to the absence of continuous technical assistance and a financial mechanism.	1.2.1, 2.1.1, 2.2.1, 2.2.2	Reduction of POPs and U-POPs from key manufacturing sectors achieved and made sustainable through Green Chemistry implementation, linking national COVID-19 economic recovery strategies with the "greening" of targeted chemicals industries in order to sustain jobs and avoid enterprises closure.
Previous industrial accidents and workplace exposure caused environmental impacts and a negative sentiment against industry;	Enterprises underestimating the importance of sharing of environmental information. Lack of coordination with govt bodies	General public seeking more transparency on environmental data and communications	Technical and financial assistance to pilot a PRTR system to facilitate the reporting of pollutant release and transfer by the industry and the access of environmental data to the public, including POPs.	General public, Enterprises	The project, based also on the experience gathered in other countries (i.e. Vietnam) will develop and pilot the implementation of a PRTR in a number of selected manufacturing enterprises, with the purpose to pave the way for the endorsement of the nation-wide PRTR regulation already in the pipeline.	3.1.1, 3.1.2 3.1.3	Public access to environmental information improved
A plan for the roadmap toward sustainability of manufacturing industry has been developed in 2015 by BOI, but it has not been implemented;	Although the plan has been developed by BOI with support from bilateral donors, the lack of a financial tool and limited involvement of enterprises has substantially prevented its implementation	Bilateral donors and BOI / DTI willing to sustain their previous efforts and to partner with the project. Financial institutions are interested in supporting FREEME	Establishment and funding of a Green Financing mechanism (FREEME) enhanced by training on Green Chemistry to support industrial initiatives aimed at the production of POPs free products with a green chemistry approach	Financial institutions	It is envisaged that in the absence of the GEF intervention, the initiatives currently in place will not materialize or will be not sustained.  The role of the GEF with this respect is therefore not only to provide financial support, but to launch a sustainable technical and financial mechanism which will be in place for the years to come to support the development of a environment-friendly manufacturing sector in the country.	2.1.1 1.2.2	POPs use prevented and Green Chemistry supported through a sustainable financial mechanism
Some existing international cooperation projects (like the SWITCH program (EU) and the GIZ projects on sustainability roadmaps, as well example of existing Green Funds) have been implemented or are in the course of implementation.	These plan need to be further supported and integrated with initiatives related to POPs which are lacking	Bilateral donors willing to sustain their previous efforts and to partner with the project	Establishment of a coordination mechanisms with initiatives carried out under bilateral cooperation or other GEF projects. Lesson learned and best practices disseminated, awareness raising initiatives put in place	Donors	The GEF intervention would indeed help to catalyze the interest of enterprises to subscribe the FREEME fund, therefore that would ensure an estimated 14,000,000 usd of grant co-financing in form of investments to support project targets.  Moreover, through the FREEME mechanism an additional amount of 6,000,000 grant would materialize as co-financing provided by financial entities to provide loan at a competitive interest rate.	4.1.2 4.1.3 4.1.4	Synergy with other initiatives ensured through coordination and communication
Some existing initiatives (like the ones on "Sustainable copper industry", "Sustainable chemical industries", "Plastic Bank" which may integrate project activities, are in place.	There is the need to further support these initiatives that can be a valuable source of co-financing for the project	Financial institutions are interested in supporting FREEME Recyclers willing to participated in training and other project activities	Coordination with bilateral donors, NGOs and national and international Financial Institution to involve them in the establishment of FREEME and in project implementation / results. Special eligibility criteria to support social aspects will be included in the FREEM	Governmental agencies, associations, NGOs, Fis		Horizontal (all outputs) 4.1.2, 4.1.3 4.1.4	Cooperation with NGOs, bilateral donors and IFI established to replicate the FREEME approach. Gender mainstreaming. Better working conditions for recyclers

Component 1. Comprehensive road-map for greening the manufacturing sector in the Philippines through a better management of chemicals, including an update of the Stockholm Convention National Implementation Plan.

Outcome 1.1 NIP updated and downstream regulation amended accordingly.

81. This outcome will result in the update of the inventory and priority actions for the initial 12 POPs, the new POPs already addressed during the NIP update carried out in 2014 (namely Lindane, Chlordecone, Endosulfan, PFOS, PBDE) and the new POPs listed after the NIP update (SCCP, PFOAs, deca-BDE, HBCDD, PCN). Based on the finding of the updated NIP, the downstream regulation will be amended to be fully consistent with the Stockholm Convention.

#### **Output 1.1.1. Updated inventory of POPs and U-POPs**

82. The Stockholm Convention on Persistent Organic Pollutants (POPs) was adopted in May 2001 with the objective of protecting human health and the environment from toxic and hazardous POPs. It entered into force on 17 May 2004 initially listing twelve chemicals as POPs. At its 4th meeting of the Conference of Parties (COP) in May 2009, the Stockholm Convention was amended to include the following nine new POPs in Annex A (Alpha hexachlorocyclohexane, Beta hexachlorocyclohexane, Chlordane, Hexabromobiphenyl, Hexabromodiphenyl ether and heptabromodiphenyl ether, Lindane, Pentachlorobenzene (also listed in Annex C), Tetrabromodiphenyl ether and pentabromodiphenyl ether) and Annex B (Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride). The amendments entered into force for most of the Stockholm Convention Parties on 26 August 2010. The Philippines updated the original NIP and included the additional POPs during the NIP update, carried out in 2013, and submitted to the Stockholm Convention Secretariat in 2014.

83. After 2010, the following substances were listed under Annex A and Annex B of the Stockholm Convention: Decabromodiphenyl ether (commercial mixture, c-decaBDE); Dicofo; Hexabromocyclododecane; Hexachlorobutadiene; Pentachlorophenol; Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds; Polychlorinated Naphthalenes; Short-chain chlorinated paraffins (SCCPs).

66. Under this output, updated inventories will be developed for all POPs listed under the Stockholm Convention, and new inventories for POPs listed under the Stockholm Convention after the last update of the NIP will be developed.

84. Under this output, updated inventories will be developed for all POPs listed under the Stockholm Convention, and new inventories for POPs listed under the Stockholm Convention after the last update of the NIP will be developed.

#### **Output 1.1.2 The NIP updated to consider the POPs listed under the SC after 2013**

85. According to Article 7 of the Convention, parties are required to develop a National Implementation Plan (NIP) to demonstrate how the country will implement the obligations under the Stockholm Convention. The Party should transmit the NIP to the COP within two years of the date on which the Convention entered into force for the country.

86. Furthermore, parties are required to review and update their NIPs in a manner specified by a decision of the COP. Among others, the addition of chemicals to the Annexes is a factor that leads to the need to review and update the original NIP for a Party. The NIP update process will enable the Philippines to establish inventories of products and articles containing new POPs and to identify priorities for each POP. Strong emphasis will be placed on the participation of the private sector and civil society to ensure their active involvement in the undertaking of the NIP update.

87. An inception workshop will be held to raise awareness of the NIP updating activity among industry and industrial associations, NGOs, university, etc) and to get a full understanding of the steps needed for the NIP endorsement and submission

88. Working groups will be established to work on specific list of POPs, i.e. industrial POPs, agricultural POPs, Annex B POPs and Annex C POPs. A legal working group will be also established. A meeting will be held to validate and discuss the outcomes of the updated POPs inventories. All working group members, government and relevant stakeholders will be invited to the meeting.

#### **Output 1.1.3 The downstream regulation amended and enforced to include provisions related to all the new POPs listed under the SC after 2013**

89. The project will assist the GoP in the process of integrating the provision on POPs/PTS in the regulations on Environmental Protection and on Chemical management (with specific reference to the DENR Administrative Order 29 Series of 1992), which are evolving but still miss consistent implementation of Stockholm Convention requirements, and which need to be complemented with risk assessment criteria and guidance.

90. More specifically, the project will ensure that the amendments to the existing legislation, and the possible new regulatory tools which would be developed, will be properly based on risk assessment / reduction / management criteria, and will be established in a way which ensures the coherence within the whole regulatory system, overcoming the current inconsistencies or overlapping among regulations which are being developed and enforced by ministries with different objectives.

91. In compliance with the Stockholm Convention, the amended regulation will include the complete ban of import and use of POPs, with specific reference to the industrial POPs (PFOS, HBCDD, PBDEs, SCCP) whose phasing out in industrial processes is going to be demonstrated in Component 2.

92. It is envisaged that, through the enforcement of this legislation, at least half of the amount of industrial POPs will be prevented during project implementation stage, and more specifically 172.5 tons out of the 345 tons of PFOSs estimated by the NIP as import in the chrome plating sector will be avoided. The amount of the other avoided POPs will be estimated at PPG stage.

#### **Output 1.1.4 Capacity of the customs officers to prevent illegal import of POPs chemicals, POPs containing mixtures and articles increased.**

93. With respect to the prevention of illegal imports and marketing of banned pesticides and industrial chemicals, the project will undertake training of customs control officers at major international harbours to improve the efficiency of inspections of imported chemicals and the capacity to identify POPs and other banned pesticides.

94. The project will also develop and provide technical assistance and manuals with clear instruction to be followed during port inspections. The project expects to provide similar technical advice to inspectorates.

95. A manual will be developed and disseminated among agri-shops, storage facilities and crop inspection units to verify the presence of POPs and illegal pesticides. Considering that evidence of the use of Endosulfan has been found during the NIP update, as part of this outcome a lot of attention will be paid to agricultural practices and crops where Endosulfan has been used in the past.

**Outcome 1.2 A roadmap for greening of manufacturing sector through Green Chemistry principles and reduction of POPs, U-POPs and other substance of concern drafted and endorsed**

96. Green Chemistry is defined as “the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances”. The green chemistry approach has been standardized in 12 general principles.

1. Prevent waste.
2. Maximize atom economy;
3. Design less hazardous chemical syntheses;
4. Design safer chemicals and products;
5. Use safer solvents and reaction conditions;
6. Increase energy efficiency;
7. Use renewable feedstocks;
8. Avoid chemical derivatives;
9. Use catalysts, not stoichiometric reagents;
10. Design chemicals and products to degrade after use;
11. Analyze in real time to prevent pollution;
12. Minimize the potential for accidents.

97. The application of Green Chemistry Principles could play an important role in reducing the potential for toxic releases or emissions from processes and products that continue to use or emit POPs. The Road Map toward sustainability developed by BOI in 2015 [1] for some industrial sectors had already the potential of enabling the environment for greening specific sectors by proposing efficient use of natural resources; encouraging the development of green industry based on environmental friendly technologies; and, proactive prevention and treatment of pollution. This provides a positive entry point for green chemistry development even though the concept might still be unfamiliar to many stakeholders.

[1] [https://www.snrd-asia.org/download/promotion\\_of\\_green\\_economic\\_development/Greening-the-Philippine-Manufacturing-Industry-Roadmap.pdf](https://www.snrd-asia.org/download/promotion_of_green_economic_development/Greening-the-Philippine-Manufacturing-Industry-Roadmap.pdf)

98. The objective of this outcome is therefore to support the country in the definition of a roadmap that would facilitate the adoption of Green Chemistry practices. This will entail sector analyses to identify GC opportunities for demonstration/application; assessment and subsequent improvement of the existing policy and regulatory framework through taking up Green Chemistry aspects (through e.g. mainstreaming or adapting/developing policies and regulatory measures). This outcome is based on two outputs:

80. The objective of this outcome is therefore to support the country in the definition of a roadmap that would facilitate the adoption of Green Chemistry practices. This will entail sector analyses to identify GC opportunities for demonstration/application; assessment and subsequent improvement of the existing policy and regulatory framework through taking up Green Chemistry aspects (through e.g. mainstreaming or adapting/developing policies and regulatory measures). This outcome is based on two outputs:

**Output 1.2.1. A detailed assessment of the key manufacturing sector for which a roadmap toward sustainability was already envisaged by the government (Copper, Plastic, Paper, Paint, Furniture and Automotive) carried out.**



99. In strict coordination with DTI, BOI and the relevant association of enterprises, the achievement of this output will envisage undertaking surveys based on gathering of existing documentation (for instance the documentation related to the roadmap toward sustainability already prepared by BOI) direct interviews, site visits and questionnaires to gather information on the factories and manufacturing processes. The survey will have the main purpose to understand the sectorial gaps toward the implementation of Green Chemistry principles and the use of hazardous chemicals – including POPs – in the surveyed enterprises. Concerning automotive, the surveys will be mainly focused at the sub-sector of metal plating.

100. With specific concern to the consumption, release and unintentional generation of POPs the following manufacturing or chemical sectors are the ones that based on international experience and available preliminary information gathered in the country may been identified as key sectors for green chemistry implementation as these may need a significant improvement in their process to reduce their impact, and which therefore will be selected for the survey:

- Electro plating industry, due to the potential use of PFOS as etching agent and mist suppressant
- Plastics manufacturing, due to the potential use of brominated flame retardants and short chain chlorinated paraffins;
- Paper (with special reference to the production of food packaging paper) , due the potential use of PFAS (which may include PFOS and PFOAs) for water and grease – repellency purposes and the for the potential release of chlorinated compound to water during the bleaching process, which may result in the formation of PCDD/Fs;
  - Solvents and Paints, due to their widespread application, the possible generation of U-POPs at their end of life stage, and the use of short chain chlorinated paraffins and some paint formulations.
- Secondary copper and secondary metal, due to the potential generation of U-POPs in the melting process
- Furniture, for the use of chemicals in the treatment of wood and for the use of glues and resins for the finishing of wood articles.
- Improvement of Energy efficiency in all the sectors will have the direct (pulp and paper) and indirect effect on the reduction of the release of mercury associated with coal consumption.

101. This survey will be conducted on at least 30 factories, to be identified during PPG phase, covering the targeted industrial sectors. For each plant visited, a survey report will be filled with the following information.

- a) Information on the proportion of job positions assigned to male and female staff, by category of job.
- b) Description of the production process for each industrial setting visited, with a tentative mass balance.
- c) Chemical profile of the company (type and amount of chemicals and raw material used in the production process, with CAS code) with specific reference to the use / release of POPs, mercury and other POPs/PTSs.
- d) Waste inventory of the firm (amount by category of waste)
- e) Energy profile of the company: type and amount of fuel consumed in each subprocess, potential interventions to increase the efficiency and reduce fuel consumption.
- f) Data concerning the monitoring of pollutant in wastewater and exhaust gas and the existence of online monitoring of the industrial process and the release of pollutant.
- g) Data related to the water use in the process cycle.
- h) Data related to the environmental monitoring

- i) Comparison of the production process with the principles of Green Chemistry
- j) Brief intervention proposal to implement GC in the visited plant
- k) Positioning, mapping and photographic documentation

**Output 1.2.2. A Roadmap for the implementation of Green Chemistry approach inclusive of the reduction of POPs and U-POPs and GHG emission agreed and endorsed by the government.**

102. Based on the survey above, an overall roadmap for the implementation of Green Chemistry principle, inclusive of the reduction of POPs use and releases, will be drafted. The roadmap will include:

- An assessment section, which will present an overview of the regulatory and policy environment, and which will present recommendations for the establishment of a policy and regulatory framework pertaining to Green Chemistry in each of the priority manufacturing sectors targeted, improvements of the policy and regulatory framework governing POPs management and recommendations for the introduction of regulatory incentives for Green Chemistry adoption;
- A section including technical standards and/or regulations on Green Chemistry in the identified priority manufacturing sectors.
- A regulatory section where regulatory measures will be proposed to put in place incentives (financial, regulatory and non-financial incentives), promote market based and consumer driven policies to encourage readiness for the adoption of Green Chemistry technologies.

**Component 2. A Green financing mechanism developed and implemented to demonstrate Green Chemistry and POPs and U-POPs reduction in manufacturing industry.**

**Outcome 2.1 A sustainable financing mechanism designed and implemented in support of the Green Chemistry in key manufacturing industries.**

103. Especially because of the current economic crisis associated with the COVID-19 pandemic, the capacity and willingness of industry to invest in environmental protection technologies is currently limited. For this reason, the core of the project will be the establishment of a Green Financing Fund (FREEME – Financing the Roadmap for the Environmental Enhancement of Manufacturing Enterprises) which will support firms with loan granted at a very low or null interest rate, if the loan is used to implement technologies or activities compliant with Green Chemistry principles or preventing the use and release of POPs.

**Output 2.1.1 A self-sustaining financial mechanism (FREEME – Financing the Roadmap for the Environmental Enhancement of Manufacturing Enterprises)** in support of Green Chemistry in key manufacturing sectors established with the initial technical and financial support of the project, through involvement of suitable financial institutions (Philippines BOI, Development Bank of Philippines, Land Bank) also as a proposed financial mechanism for green recovery from COVID-19 including PPE for workers)

104. A self-sustaining financial mechanism (FREEME – Financing the Roadmap for the Environmental Enhancement of Manufacturing Enterprises) will be established to:

- Support the implementation of Green Chemistry upgrade of production lines, with less-chemically intensive products and materials, replacement of POPs with non-POPs / non-hazardous chemicals, management of obsolete POPS stocks if any in the selected industrial sectors;
- Support the private sector to get incentives policy (e.g. tax, fee, credit fund, investment equity) in production of eco-friendly products manufactured in compliance with Green Chemistry and POPs-free products;
- Support activities related to the replacement of processes containing POPs (for instance mist suppressant in chrome plating; SCCP in paint, etc) with non-POP processes;
- Support industries on environmentally sound design of article and materials which are intrinsically compliant with flame-retardant or water-repellence standards and therefore do not need chemical treatment.

105. To this end, enterprises will be assisted in identifying and submitting applications to access finance from the FREEME green financing schemes, but also from other similar financing scheme with similar objectives, particularly these provided by governmental entities, like the DTI/BOI, the Philippine Development Bank, the Philippine Land Bank, and by bilateral entities like international development banks and foreign donors.

106. The project will also assist the financial entity supporting the FREEME on training event for partners to raise the awareness of enterprises on possible green finance instruments, and to facilitate their access to competitive loan and grants, in order to support quality-controlled conversion of production lines, and to manage obsolete POPS stocks A grant financial support with a high leverage factor (1/10) will be provided to support projects in the field listed above.

107. In practical term, the FREEME mechanism to be developed under the project will work in this way.

- One or more FREEME supporting entities will be identified (BOI, the Philippine Development Bank and the Land Bank of Philippines have already declared their availability to support the FREEME mechanism);
- Eligibility rules to access the FREEME will be developed and publicized;
- The project will assist enterprises to submit their projects to the FREEME entity, and will provide the Co-financing entity with a technical and financial support intended to cover part of the operational expenses
- The Co-financing entity will make available loans, for an amount estimated in 14,000,000 USD, at an agreed interest rate applied only to eligible projects, with an interest rate of 2.5% over max. 10 years.

108. In this way, considering that the commercial interest rate in the Philippines is currently around 6.5%, and that the FREEME supporting entity will provide loan at around 2.5% interest rate for an overall amount of 14,000,000 USD, the direct co-financing from FREEME entities over a total loan of 14,000,000 disbursed over 10 year may be calculated as  $((6.5\%-2.5\%)\times 10) \times 15,000,000 = 6,000,000$  USD; the cash co-financing from the enterprises subscribing the loan would be 15,000,000 USD from direct investment, and the GEF grant contribution to cover technical assistance and initial investment for the enterprises applying for the Green Fund would be 1,500,000. In other words, the leverage mechanism established under this green-financing scheme could mobilize 21,000,000 USD cash against a GEF financing of 1,500,000 USD, and will be entirely accountable and traceable. Further incentives could come through tax reduction for investment related to environmental protection, to be proposed during project implementation.

This mechanism is further explained in the table below:

FREEME mechanism	
Commercial interest rate %	6.5
Green Fund interest rate %	2.5
Differential interest rate (supported by VEPF)	4
Loan duration (years)	10
FREEME entity co-financing through interest rate support (USD)	\$5,600,000.00
Industries direct investment (USD)	\$21,000,000.00
GEF Grant (USD)	\$1,500,000.00

109. The FREEME fund will be supported by training on Green Chemistry and its impact on circular economy, and technical assistance to enterprises to submit their applications through a dedicated project office. Gender mainstreaming and inclusiveness aspects will be included as mandatory criteria for access to funds. Special provisions will be included to ensure the access of micro/small enterprises. Two priority pilot plants will receive a grant – instead of a loan – for the implementation of GC activities if they can demonstrate that that will result in the avoidance of a significant amount of POPs. The training will include the development of business plan associated with the new GC processes.

#### **Outcome 2.2 Implementation of Green Chemistry Initiatives in key manufacturing sectors.**

##### **Output 2.2.1 At least 4 industries from the key manufacturing sectors implementing Green Chemistry approach under FREEME, with direct reduction of POPs**

110. Tentatively, and based on the knowledge gathered until now, the following industries would be the most suitable to be improved through the implementation of Green Chemistry and POP reduction:

a) **Electro plating from automotive sector** (currently using CrVI processes with PFOS as mist suppressant and etching chemical): The Green Chemistry intervention could consist in: Increase the number of closed-loop processes to prevent the release of contaminants in wastewater, including PFOS. Ensure rinse water is treated before release. Improve waste treatment processes. Reduce CrVI to CrIII before discharge. Reduce/optimize the use of etching agents. Adopt Direct Current (DC) rectifiers and automated control of the chromium bath to reduce the loss of the plating agent (chromium). Use alternative non-PFOS mist suppressant or non-chemical mist-suppressants (like poly-propylene floating balls) or non PFOS mist suppressants. Introduce alternative chrome-plating processes (under development: trivalent chromium, spray and PVD coatings). Introduce process control to reduce energy use for heating baths (e.g. insulation of plating baths to prevent energy losses). Use of less toxic, more balanced, mixtures of catalysts to reduce toxicity of the bath. Real time monitoring of air and wastewater effluents.

b) **Plastic manufacturing / Polymers:** Better control of waste effluent. Reuse/recycle plastic wasted during manufacturing. Improvement of the polymerization process. Reduce the quantity of additives through optimized processes. Replace brominated flame retardants with non-brominated non-POPs flame-retardants. Restrict / control the import of deca-BDE in the country. Improve design of articles so that Flame Retardants are not necessary (introduce alternative measures to reduce fire risk). Reduce heating through better process control and insulation of reactors. Introduce quality criteria for plastic manufacturing, including the use of recycled plastic. Production of bio-degradable/bio-plastics, which may prevent the release of U-POPs as a result of accidental combustion. Real time monitoring of air and wastewater effluents introduced. Improve the storage of hazardous chemicals, by optimizing and reducing the quantities stored, and by establishing surveillance.

c) **Pulp and Paper:** Improve recycling of lignin from the wastewater process. Improve wastewater treatment. Assess and implement water reuse in various processes. Build a database of chemicals used in the pulp and paper sector to increase awareness. Replace PFOS and PFAs with other water-repellent substances. Restrict/control the import of PFOS and PFAS substances in the country. Adopt Hydrogen Peroxide bleaching or ozone bleaching as a substitute to Sodium Hypochlorite bleaching. Reduce heating through better process control and insulation of vessels. Introduce quality criteria for natural fibres, including verification of residues of organic chemicals. Test the final product for the presence of chemical residues, including POPs. Using a solid metal catalyst and a hydrogen peroxide solution as an 'activator' to kill microorganisms by oxidation instead of pesticides. Develop a database of chemicals used in the pulp and paper industry. Real time monitoring of all process modules. Real time monitoring of air and wastewater effluents. Adopt automated control of process parameters (e.g. temperature, liquor level, chemicals feed) to reduce applied chemicals and auxiliaries. Improve the storage of hazardous chemicals, optimizing and reducing the quantities stored, and establishing surveillance.

d) **Solvent / Paint:** Promote the development of industries in the bio-solvent sector. Design solvents, which can replace halogenated solvents or BTEX solvents commonly used in products. Redesign paint mixtures to avoid the use of SCPP. Production of solvents from the distillation of vegetable, renewable feedstock. Develop the production and promote the use of bio-degradable solvents to replace chlorinated, non-degradable solvents.

e) **Furniture industry:** Use wood from certified industries. Use of bio-based oil and varnish instead of chemical wood varnish. Reduce the use of glue containing hazardous chemicals. Reduce the generation of cutting residues and increase their recycling / reuse. Develop a database of the chemicals used in the furniture industry. Realtime monitoring of process step, with specific reference to those involving the use of chemicals.

111. Under this output, at least 4 industries will be selected as pilot facilities for the implementation of Green Chemistry approach and phasing out of POPs.

112. The criteria for the selection of the pilot industries will be as following:

- Operating in one of the five sectors listed above (electro-plating, plastic, pulp and paper, solvent-paint, furniture) or in the non-ferrous metal sector;
- Committed to implement an improvement of their productive cycle compliant with the Green Chemistry principle and the Stockholm Convention;
- Capable to demonstrate the reduction / phase out of POPs and/or U-POPs and the baseline before project implementation
- Compliant with the national rules related to occupational health, environmental protection, waste disposal;
- Compliant with the national rules related to the rights of workers
- Committed to reduce gender gaps in their premises, including equal access to job opportunities, and equal wages.

113. This output will be achieved through the following activities:

- Preparation of a Green Chemistry demonstration plan for the selected factories;
- Discussion of the demonstration plans in dedicated workshops;
- Drafting of a procurement plan for the needed interventions;
- Procurement and testing of the equipment
- Demonstration and monitoring of the Green Chemistry and POPs reduction intervention.

114. In addition to the implementation of specific Green Chemistry interventions capable to reduce POPs, number of general intervention for the pilot sectors will be selected for implementation, as following:

- Development of a database of substances and mixtures used in the demonstration sector for a more easy identification of non-toxic, non-POPs alternative substances;
- Establish sector-specific environmental monitoring plans
- Promote, whenever possible, the use of environmentally friendly biocides in industrial processes (for instance in the textile and pulp and paper sectors);
- Promote the use of substances alternative to POPs, with specific reference to PFOS and PFOAs, C-PBDE, SCCP;
- Promote, whenever possible, alternatives to chlorinated solvents in industrial processes;
- Minimize water discharge and establish automatic control of water quality.

115. Technical assistance will be provided by the project team in close partnership with DTI and BOI, the management of industrial zones, research institutions and other partners. Prior to GC introduction, each enterprise will undergo an in-depth plant assessment, after which a detailed Green Chemistry intervention plan will be drafted, including a financial investment and operation plan. After approval of the Green Chemistry intervention plan, the project will support the introduction of GC approaches and GC technologies.

**Output 2.2.2 Technical guidance and roadmaps for the implementation of Green Chemistry developed for the prioritized sectors of Copper, Plastic, Paper, Furniture and Automotive.**

116. To encourage replication of best practices and success stories and to provide a platform for continuous capturing and sharing of GC experiences, the project will, for each of the sector relative to the four plants selected for the implementation of Green Chemistry, prepare technical tools and technical guidance on the introduction of Green Chemistry.

117. Initially, these tools and guidance documents will be applied and tested throughout the training and capacity building of entities that are participating in the demonstrations activities as part of Output 3.1.3. However, these documents will be considered as living documents into which experiences, lessons-learned and success stories will be integrated as they become available.

### **Component 3. Enhancing the chemical management and reporting of POPs countrywide through the implementation of PRTR system**

#### **Outcome 3.1. A reporting system for industrial emission including industrial POPs and U-POPs designed and implemented.**

**Output 3.1.1. A PRTR (Pollutant Release and Transfer Register), inclusive of POPs, U-POPs, GHG and heavy metals designed.**

118. PRTR (Pollutant Release and Transfer Register) is intended to provide easily accessible key environmental data related to the generation of POPs and PTS from industrial sectors, as well as monitoring information. The register contributes to transparency and public participation in environmental decision-making.

119. The PRTR will be developed in compliance with the international standard on PRTR established by the UNECE:

120. The implementation and enforcement of a PRTR regulation will allow to:

- Maintain a database of environmental monitoring, with specific reference to POPs and priority PTS (for instance, mercury)
- Prioritize industries to be included in the PRTR register;
- Identify the list of pollutants to be included in the register (including industrial use POP, PTS, GHG substances and mercury)
- Define the responsibilities in enforcement of the regulation and the supervision methods;
- Define the modality to communicate with industries avoiding overlapping and conflicting with other norms requiring the submission of environmental information from the enterprises.
- Identify format of the PRTR such as this is compliant with format established under other international PRTRs database

#### **Output 3.1.2 PRTR piloted in at least 20 factories in key manufacturing enterprises.**

121. A pilot PRTR system will be developed and piloted in at least 20 industries. This will entail:

- Coordinate with the firm which have been surveyed under Output 1.2.1 to gather relevant information and seek their participation in piloting the PRTR.
- Agree with the DTI and DENR the list of industries which should be part of the PRTR piloting. These should be in a number of at least 20 industries to be selected among most representative industrial sectors in the country.
- Develop the list of substances to be included in the PRTR system, and establish the methodology for sampling and analysis of industrial effluents and the emission factor needed for the calculation of each pollutant from the relevant industrial sector;
- For each selected industry, provide direct instruction on the standardization of data and data input into the software for PRTR report.
- Collect the information to calculate the release and transfer for each PRTR substance for each pilot enterprises, enter these information in a database and pilot a PRTR software to manage this database.
- A PRTR software is developed and tested;
- POPs/PTS data entered and PRTR report generated.

#### **Output 3.1.3 Regulation on PRTR drafted and endorsed.**

122. Based on the experience gathered through the design and piloting of PRTR, a draft regulation on PRTR will be prepared, discussed in a dedicated workshop with stakeholders of industrial sectors and the government, and eventually endorsed.

123. The PRTR draft regulation will include as a minimum

- a. The list of industrial facilities subjected to PRTR, and procedures for list revision;

- b. The list of chemicals subjected to PRTR, and procedure for list revision;
- c. Threshold criteria by industrial sector and chemical;
- d. The format of data reporting and storage;
- e. The duties of competent authorities in the periodical updating, storing and communication of data;
- f. Quality assessment and Quality Control procedures;
- g. Methodologies for release estimation based on emission and release factors;
- h. Methodologies for sampling and analysis of pollutants from industrial sources, as well as in waste and wastewater;
- i. Criteria for data disclosure;

**Component 4: Knowledge Management & Awareness, Project monitoring, learning, adaptive feedback and evaluation.**

124. Apart from supporting the expected project monitoring activities, this component will be important to capturing and sharing any lessons, best practices and lessons captured in the course of piloting innovative approaches to sustainably managing and/or eliminating use of the new POPs species within the project. This will be important not just at national level, but as a contribution to GEF Learning, and potential for replication in other projects.

125. As such, related outcome for this component is articulated in one outcome and four outputs as following:

**Outcome 4.1: Project lessons and results monitored, verified, captured, shared, sustained and replicated. This outcome can be supported by the following outputs**

**Output 4.1.1- Development and application of adaptive overall management and risk management tools and plans for use throughout the project, and particularly in response to needs and Mid-term Evaluation (MTE) findings**

126. A detailed risk management tool and plan, integrating the preliminary one already included in this PIF, will be developed at PPG stage. The risk management tool will be used along with the other monitoring system (PIR, Project Work Plans, Project Report) to achieve a constantly updated picture of the situation of the project. The result of the MTE will be elaborated into management response and translated into adaptive measures to ensure that any difficulties found in the first stage of the implementation is promptly addressed.

**Output 4.1.2 - Collection and dissemination of lessons-learned, best practices and experiences at national, regional and global level to support replication.** The project will generate the following information which will be very relevant and useful for any institution or private entity wanting to access the knowledge related to POPs and Green Chemistry:

- Information on Green Chemistry, POPs free or less chemically intensive products and material.
- Information on the eligibility to financing programs established under the program.

**Output 4.1.3 - Capacity and awareness building activities organized for decision makers, stakeholders, and practitioners, to enhance the sound management of chemicals and protect human and environmental health.**



127. Awareness building activities related to the implementation of Green Chemistry in manufacturing processes, and the reporting system established through the piloting of the PRTR will be conducted during the project implementation by making use of conventional media (TV broadcasting, newspaper), internet TV (Youtube and FB channels) and dedicated events (workshops, training events and site visits to the industries). The effectiveness of the awareness building activities will be measured through specific KAP surveys to be conducted at project starting and at project end. A network of GC experts and institutional expertise will also be established through capacity building and training.

128. This activity therefore aims to build technical capacity among government entities and industry, increase capacity of existing institutions and partnerships for Green Chemistry, and establish a network of trained experts, consultants and firms who will work as a help desk to provide advice to industry in adopting Green Chemistry practices. In practical term this will be established through a blog platform or a Green Chemistry line which can be accessed by the industry to ask specific question on the implementation of Green Chemistry.

#### **Output 4.1.4 - Development of an integrated knowledge management system on POPs and their alternatives**

129. This output will mainly concern the management of project documents and reports. Under the project a number of technical report, progress report, administration documents, evaluation reports training materials and scientific reports will be generated. Moreover, the project experts will have to have access to the same information generated by other projects. All the documentation generated by the project will be therefore categorized and uploaded in a website, with an access policy differentiated by users (administrators, project technical experts, project management units, general public, etc.). A blog under the website, or a project Facebook page, maintained by a dedicated person, will have the main function to collect information and initiatives generated by similar project worldwide and to connect people from the various project for exchanging of information.

### **ALIGNMENT WITH GEF FOCAL AREA AND/OR IMPACT PROGRAM STRATEGIES**

130. The project is fully aligned with the GEF7 Chemical and Waste Focal Area Strategy, Program 1 "Industrial Chemical Programs", as it seeks to eliminate or significantly reduce POPs substances. The project will address chemical waste at the end of life and , chemicals that are used or emitted from processes or products.

131. More specifically, the project envisages:

- The prevention of waste/products containing persistent organic pollutants from entering material recovery supply chains
- Elimination of the use of and persistent organic pollutants in products (Including brominated flame retardants, PFOS and short chained paraffins) as well as the use of mercury in products through introduction of alternatives in the products with a preference to non-toxic chemicals
- Introduction and use of best available techniques and best environmental practices to minimize and ultimately eliminate releases of unintentionally produced POPs and mercury from major source categories included in the Stockholm Convention including, but not limited to, cement manufacturing, coal fired power plants, various metallurgical processes, waste incineration; (project component 2)
- The project will also strive to strengthening of national legislation and regulatory capacity for meeting the Stockholm convention obligations, with regard to persistent organic pollutant)

- The project will also support sustainable material management initiatives, including sound material-cycle society, and sustainable materials management approaches, promoting the adoption of improved production, consumption and environmentally sound disposal patterns.

#### INCREMENTAL/ADDITIONAL COST REASONING AND EXPECTED CONTRIBUTIONS FROM THE BASELINE, THE GEFTF, LDCF, SCCF, AND CO-FINANCING

“Business as usual” situation (without GEF intervention)	Scenario with GEF intervention
<p>The government of Philippine has undertaken and is continuing undertaking a number of actions aimed at improving and greening the industrial manufacturing, the phasing out POPs, implementing a better management of hazardous chemicals and a more efficient reporting of industrial emissions.</p> <p>The first National Implementation Plan of the Stockholm Convention was submitted in May 2006 and updated and upgraded in August 2015.</p> <p>One of the priorities listed in the updated NIP was the need to improve the inventory of new POPs, with specific reference to PFOS. After the listing of additional 6 chemicals under the Stockholm Convention, DONRE had plan to develop a second update of the NIP, however technical difficulties and the absence of guidance for some new POPs has so far hindered this activity.</p> <p>As explained above, the country had also started the regulatory process leading to the implementation of PRTR. This effort, considered crucial in the sake of improving the transparency concerning the information on industrial emission of pollutants in the environment, is currently pending approval, due also to the difficulties found in implementing the system.</p> <p>Similarly, numerous initiatives have been undertaken so far to develop roadmaps for improving the sustain</p>	<p>The GEF intervention, through the proposed project, will provide a platform to sustain ongoing initiatives started or planned by the government and private industries in the field of “Greening of industrial processes”, inventory and reporting of industrial emission and POPs, and phasing out of industrial POPs.</p> <p>This will be undertaken through both technical and financial assistance interventions, including the development of a green financial mechanism (the FREEME, Financing the Roadmap for the Environmental Enhancement of Manufacturing Enterprises).</p> <p>The project intends to provide technical support for the second upgrade of the NIP, which will include inventory update of all the POPs already covered by the Stockholm Convention in 2013, plus the additional new POPs listed under the Convention Annexes up to 2020.</p> <p>The project, based also on the experience gathered in other countries (i.e. Vietnam) will develop and pilot the implementation of a PRTR in a number of selected manufacturing enterprises, with the purpose to pave the way for the endorsement of the nation-wide PRTR regulation already in the pipeline.</p> <p>The experience achieved through other GEF/UNDP pr</p>

<p>ability of the manufacturing sector of which the “Greening Industries Roadmap” implemented by GIZ in 2015 and promoted by the Philippine Board of Investment has been one of the most relevant and indeed has prepared a number of sectorial roadmap and strategies that should be considered one of the starting point for this project. Other relevant initiative, supported from time to time by the GoP of private industries, have been, for instance, the “Sustainable copper in industry” (BOI, 2019); the work toward the development of biodegradable substitutes of plastic (DOST-ITDI (2017); the Plastic Bank (2016) for the recycling of household plastic waste; The establishment of the Philippine Alliance for Recycling and Materials Sustainability (PARMS); the development of Activated Carbon from coconut waste.</p> <p>All these activities testify a significant effort toward the development of a sustainable manufacturing industry, however lack coordination, are not supported by a sustainable financial scheme, and does not explicitly cover the issue of new POPs which may be still used in some products and manufacturing processes.</p>	<p>object in the implementation of Green Chemistry in other ASEAN countries will be an asset in the implementation of the “Green Chemistry component” of this project for the implementation of the “Greening Roadmap” already started in 2015, which however did not materialize due to the absence of continuous technical assistance and a financial mechanism.</p> <p>All the activities above will be implemented with the objective to completely phase out the import, export and use of all new POPs which are currently directly or indirectly used in the industrial manufacturing.</p> <p>This will also require technical support to the custom authority for the identification of chemicals, either as such or in products or mixtures, that may contain POPs and which should therefore be banned for import or export.</p> <p>It is envisaged that in the absence of the GEF intervention, the initiatives currently in place will not materialize or will be not sustained. The role of the GEF with this respect is therefore not only to provide financial support, but to launch a sustainable technical and financial mechanism which will be in place for the years to come to support the development of a environment-friendly manufacturing sector in the country.</p>
Global Environmental Benefit (without GEF Intervention)	Global Environmental Benefit (with GEF intervention)
<p>The updated NIP report that around 345 tons of POPs were as estimated to be contained in imported chrome metal-plating pigments and preparations; 147 tons contained in synthetic carpets and fire resistant textiles; 33.6 tons contained in greaseproof and food paper. Concerning PBDE, the NIP estimates brings a value of 24 tons from the automotive sector, excluding deca-BDE. based on the figures provided by SAFL, the amount of deca-BDE would be in the order of 10.6 to 45.2 tons for the vehicle disposed in 2012. Figure</p>	<p>The project will achieve the phase out of industrial POPs by the combination of a number of initiatives.</p> <p>First of all, all the new POPs will be included in the current environmental regulation of the country (DENR Administrative Order 29 Series of 1992) with the effect of the immediate phasing out of these chemicals.</p> <p>Secondly, the manufacturing industry will be facilitated and supported in the identification and implementation of alternative processes, materials or chemical</p>

<p>es are missing for SCCP, however based on the experience from other projects it may be expected that the amount of SCCP consumed only in the manufacturing of specialized paint is in the order of tenths of tons per year. As currently there is no regulation in place to prevent the use of these chemicals, it could be envisaged that in the absence of the GEF intervention these figures would be still in place.</p>	<p>s which would replace POPs with other chemicals. or would be based on non-chemical approaches.</p> <p>Thirdly, the project will support the custom authority in enforcing the banning of the new POPs, so that the provision included in the legislation will actual concretize.</p> <p>This therefore will result in the complete phasing out of PFOs and SCCP utilized in industrial manufacturing sectors covered by the project, which can be quantified – adopting a conservative approach – in half the amount of PFOS estimated in the NIP for the chrome plating sector, half the amount estimated for the furniture sector and at least 10 tons of SCCP from the paint sector. Further reduction cannot be calculated at this stage as would be based on the PPG preliminary inventory</p>
Role of co-financing from baseline projects	The GEF Role
<p>The Government of Philippine contributes to the budget of the project through a number of activities, some of which could be revamped through the project. That could amount to around 23,000,000 USD out of which 4,500,000 as grant.</p> <p>The GEF intervention would indeed help to catalyse the interest of enterprises to subscribe the FREEME fund, therefore that would ensure an estimated 14,000,000 USD of grant co-financing in form of investments to support project targets. Moreover, through the FREEME mechanism an additional amount of 5,600,000 grant would materialize as co-financing provided by financial entities to provide loan at a competitive interest rate.</p>	<p>The project would not only consist in a technical assistance provided and supported with the GEF grant (6,562,500 USD). The project is indeed designed in such a way that its implementation will catalyze the materialisation of investment from industries and grant co-financing from financial entities which wouldn't happen otherwise. The project would also revamp a number of governmental activities in the field of POPs inventory, phasing out and reporting that otherwise would likely be discontinued. In this sense it may be affirmed that the role of the GEF in this project is catalytical, as it would ensure materialisation of investment with a very good leverage, with a mechanism that will be replicated and sustained after project closure.</p>

## GLOBAL ENVIRONMENTAL BENEFITS (GEFTF)

132. The project will lead to a complete stop of the import and use of industrial POPs in manufacturing processes in the Philippines (Hexabromobiphenyl; Hexabromocyclododecane; Hexachlorobenzene; Hexachlorobutadiene; Pentachlorobenzene; PFOS and PFOAs)

### **Short Chain Chlorinated Paraffins and PFOS.**

133. During implementation, It will directly reduce by at least 50% the use of PFOS and SCCP in the manufacturing industry, leading to a direct reduction of PFOS compared to the 2015 NIP estimation of at least 172.5 tons of PFOSs import prevented, a direct demonstration of 10 tons PFOS avoidance in the industry and a reduction of SCCP, PBDE and PBB (to be better assessed at PPG but tentatively estimated as 10 tons based on similar projects carried out by UNDP in Vietnam), and will lead to the complete banning of the use of all POPs in the manufacturing process within the sustainability stage of the project (within 5 years after project conclusion).

134. This will be ensured through a push-pull mechanism: a rule forbidding the use of these chemicals in the manufacturing process will be immediately endorsed, and simultaneously, industry deciding to phase out POPs – through the implementation of a Green Chemistry approaches within project deadline will be supported through a Green Financing mechanism (grant or loan as it applies).

135. Beneficiaries. Conservatively, it may be assumed that 1 kg of POPs prevented could impact directly at least 10 beneficiaries, through avoidance of contact with POPs in the manufacturing or use stage, or because of reduced release in the environment. This would not consider beneficiaries at global scale. Therefore the project could positively impact at least 1,850,200 beneficiaries. The project will also generate benefits in term of awareness raising and training. Awareness raising through different media (TV and internet broadcasting, newspapers) could potentially reach at least 100,000 people. Training will reach a minimum number of 200 workers from the private and public sectors.

## INNOVATION, SUSTAINABILITY AND POTENTIAL FOR SCALING UP.

### **Innovation**

136. The Green Chemistry approach is itself based on a mixture of consolidated technologies and innovative approaches. The innovativeness of Green Chemistry lies however in the fact that it shift from the concept of “substance replacement” to a more wide approach which involve the design of product and processes to reduce the environmental footprint of the manufacturing of chemicals and of chemically intensive products. In the Philippine, the Green Chemistry approach is totally innovative, although efforts toward the increase of sustainability of manufacturing processes have been undertaken at different levels (for instance the Road Map toward sustainability and inclusiveness promoted by the Board of Investment). The fact that the Green Chemistry approach is formalized and consolidated into 12 well described principles constitutes already a clear guidance toward its implementation through the development of sector -specific checklists.

137. In addition to the Green Chemistry approach, even the financing scheme which is envisaged under the project may be considered as a blend among classical financial scheme and innovation. The innovation here consists mainly in the fact that the eligibility criteria are to access the competitive loan includes compliance with the Stockholm convention and the project objectives. Applicant industries will therefore receive a double benefit: from the financial side, the access to a competitive loan to implement their investments; from the technical side, the technical assistance needed to develop projects which are

compliant with the eligibility criteria established under the FREEME mechanism. Additionally, as the environmental liability of the applicants would be reduced by the implementation of their eligible projects, it may be considered, together with the Financial Entities, whether this reduced liability may be used to compensate a lower level of financial guarantee compared to the one usually required to access loans.

## Sustainability

138. The FREEME mechanism - or similar mechanisms – are to be designed and implemented in a manner that assures its sustainability catalyzed by the project. This stems from the consideration that any incentive mechanism, to be successful and sustainable, need to bring a net benefit to a. the donor, b. the beneficiary, and c. the community through the following pillars:

a. On the side of the donor, the government and financial entities will benefit from FREEME through a reduced, although not null, interest rate, and to reduction of expenditures related to the reduced risk of chemical accidents and, last but not least, the reduced healthcare expenditure associated to exposure of the public and workers to POPs. Indeed, there are already a number of financial mechanism in place (the PEPP, the tax reduction for green jobs, the BOI support for the Leyte Ecological Industrial Zone ) testifying that the government sees the policy of environmental incentives as a promising one, key in promoting a more environmentally friendly manufacturing.

b. An incentive mechanism is not sustainable if the beneficiary does not achieve a direct benefit from it. Beneficiaries are the clients, and if they don't apply for the incentive, the mechanism fails. For enterprises, there will be an obvious benefit in accessing loan for investment at a convenient interest rate. However this could be not enough: the project will therefore ensure that enterprises applying to FREEME will achieve a significant facilitation in accessing to credit, and will benefit from a range of training technical assistance support to ensure that their benefit will also include how to reduce their operational cost (through, for instance, reduced generation of hazardous waste, reduced cost for the purchase of raw material, reduced illness rate of the workers, reduced energy consumption, reduced cost associated to insurance or liabilities). This support to enterprise is probably the most important tool to ensure the success of the FREEME

c. The third pillar of the sustainability of FREEME as incentive mechanism lies in its public acceptance, which depends on the presence of a net benefit (environmental, health, social) for the community and the way this benefit is communicated. The implementation of GC initiatives would have obvious environmental and health benefits, for both the general public (reduced releases of POPs and toxic chemicals in the environment), the consumers (reduced toxicity of products) and workers (better workplace conditions). Greening manufacturing factories also mean a greater stability for the enterprises which will achieve an improved relationship with local communities, with a positive social impact in terms of job opportunities and social inclusion. Public acceptance also implies a benefit for the government as a donor. These benefits will be communicated through a range of targeted awareness raising initiatives.

139. Therefore, although the sustainability of FREEME is not automatic, the project will look into the steps and actions to ensure its long-term sustainability after project ends are clear and feasible.

140. In any case, once the project is completed, the financial support needed to ensure that eligible projects may access a financial benefit in terms of reduced interest rate would be minimal and would be overcompensated by the reduced environmental footprint ensured. Even in case the government should intervene with direct financial support to sustain a reduced interest loan for sustaining Green Chemistry or similar initiatives, the cost would be easily compensated by the reduced risk of chemical accidents associated with the implementation of Green Chemistry.

141. Therefore, it is expected that the financial mechanism established by the project will be sustained also after project end. Beside the sustainability of the financial mechanism, it has to be noted however that the project is fully compliant with a number of actions and activities which were already undergoing – although at a slow pace. The implementation of this project will act as a catalytic factor – starting from the NIP update and further support by improvement of the regulation, implementation of a PRTR and awareness raising -that will ensure that the project actions will be sustained.

#### **Potential for scaling up**

142. There is wide potential for the scaling up of the PRTR, which will be piloted in a limited number of enterprises with the specific purpose to pave the way to a national regulation on PRTR nationwide and its nationwide implementation. The drafting of regulation and road-maps for the implementation of GC in the Philippines has been envisaged to facilitate its diffusion along all the Philippine manufacturing enterprises.

#### **CONSIDERATIONS IN MITIGATION IMPACTS OF COVID-19 PANDEMIC**

143. The COVID-19 pandemic is bringing significant disruption in local and global economies, and this could be one of the most serious economic setbacks in the history. While the impact of the pandemic will vary from country to country, it will most likely increase poverty and inequalities at a global scale, making achievement of SDGs even more urgent. Without a socio-economic responses, global suffering will escalate, jeopardizing lives and livelihoods for years to come. Immediate development responses in this crisis must be undertaken with an eye to the future.[1]

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[1] <https://unsdg.un.org/sites/default/files/2020-04/UN-framework-for-the-immediate-socio-economic-response-to-COVID-19.pdf>

144. Although the spread of the COVID-19 pandemic is still evolving, with several countries transitioning between first to second waves of infection, which is also the case of Philippines, it is also not totally clear the extend of impacts and the type of actions that need to be fully deployed to support the recovery.

145. However, minding that the project aims to work in close partnership with the private sector, it is anticipated that its activities will contribute to industries in the targeted sectors to join the green recovery process by internalizing best practices and techniques linked to green chemistry. The increased access to green and low-cost financial mechanism may be critical to maintain the economic activity of targeted industries while transitioning to greener processes and products. This action is expected to be linked that the national efforts of recovery after COVID-19 and is expected to support to maintain jobs in the targeted industries. This will be critical to position the industrial sectors of Philippines in the path of an environmentally responsive participation but also to alleviate some economic impacts on livelihoods of the people employed in these sectors, as well as the health impacts of the pandemic.

146. In any case, UNDP will consider, during the PPG Phase, the principles of the UN framework for the immediate socio-economic response to COVID-19, as well UNDP's Guidelines on UNDP's integrated response to COVID-19 potential linked and or parallel actions that could help decision-makers look and design beyond recovery, towards 2030, making choices and managing complexity and uncertainty in the green economy area to support the recovery from COVID-19 impacts.

147. Additionally, the following precautions/risk mitigation plan will be deployed during PPG phase to cope with any potential challenges that still may be resulting from the COVID-19 pandemic:

- a) Staff, including national and international consultants will be required to work from home, whenever possible, and following the general guidelines of the Implementing Partner;
- b) Due to possible travel restrictions and quarantine requirements, if needed, international consultant will be required to stay in the Philippines for a period of at least 2 months, including the compulsory quarantine period, instead of carrying out multiple short visits. The PPG schedule will be arranged accordingly.
- c) Virtual meetings and consultations will be held in place of face to face meeting.
- d) Activities requiring presence in the field will be arranged adopting all the measures to prevent the infection. Use of proper PPE will be promoted by the PPG and specific safety guidelines to be deployed.

148. In the event the pandemic still persists when project implementation starts, the additional measures will be deployed:

Project staff, including national and international consultant will be required to work from home whenever possible;  
Due to travel restrictions and quarantine requirements, if needed, international consultant will be required to stay in the Philippines for a period of at least 2 months including the compulsory quarantine period instead of multiple short visits. The PPG schedule will be arranged accordingly.

Virtual meetings will be held in place of face to face meeting.

All the activities to be carried out in the field, including installing and testing of new equipment, building of infrastructures, environmental monitoring etc. will be carried out following the national rules for the prevention of COVID-19 infection.



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

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

149. The project will be implemented nationally. Maps of demonstration sites will be developed during project implementation.

## 2. Stakeholders

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

Indigenous Peoples and Local Communities

Civil Society Organizations Yes

Private Sector Entities Yes

If none of the above, please explain why:

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement.

150. In the early stage of the development of this project, around 4th quarter 2019 and before the COVID-19 outbreak, the team of consultants in charge had several meetings and consultations. There were meetings and consultations held with several industries (automotive, fire extinguisher distributors), with the PMU of the World Bank I-POP project, meeting with the Fertilizer and Pesticide Authority and with EMB/DENR representatives, with UNDP representatives.

151. Due to the restrictions to movement and meetings during the COVID-19 outbreak, several meetings were held directly through Skype or other video-conferencing tools by DENR and UNDP. These involved discussion with organizations, private sector entities, and talking among Ministries (DENR and DTI). During the PIF stage no meetings with local communities and indigenous people were carried out due to difficulties in arranging on site meetings during the pandemic.

152. However, it is anticipated that the project will take place in established and legalized industrial zone, and UNDP's SESP procedure identified low risk of impact on indigenous people and their lands/culture. However, PPG phase will continue this engagement with indigenous people as part of the Social and Environmental Safeguards Mechanism of UNDP.

153. In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement. As the "new normal" would be foreseen in the holding of gatherings and meetings, it is expected that the engagement of the stakeholders will heavily rely on the existing partnerships within government and the Civil Society and, if deemed necessary, Indigenous Peoples Groups may which will be conducted using virtual means.

154. It is expected however, that extensive reach on the all possible stakeholders to be consulted during project preparation will be done. A preliminary list of stakeholders which will be involved in the project preparation and implementation is listed below.

Stakeholders	Role
Environmental Management Bureau (EMB)	The EMB is a line bureau of the DENR responsible for implementing national policies on environmental impact assessment, toxic substances and hazardous waste control, air and water quality, solid waste management, and environmental education. It is also tasked by the Republic

	Act 8749 (Clean Air Act of 1999) to establish inventory of all POPs sources. As such, EMB will be the lead agency for the project to ensure that the activities and timelines in the NIP are implemented and met, respectively.
Department of Trade and Industry (DTI)	DTI is the primary agency of the government responsible for regulating the country's trade, industry and investment activities. It serves as the catalyst for intensified private sector activity to accelerate and sustain economic growth of the country.
Department of Trade and Industry- Bureau of Product Standards (BPS)	BPS is a government agency under DTI responsible for developing, implementing and promoting Philippine National Standards. DTI-BPS will have a critical role in establishing standards especially for the identified POPs and UPOPs alternatives.
Department of Labour and Employment (DOLE)-Bureau of Working Conditions (BWC)	DOLE is the national government agency mandated to formulate policies, implement programs and serve as the policy-coordinating arm of the Executive Branch in the field of labour and employment. BWC primarily performs policy and program development and advisory functions for DOLE in the administration and enforcement of laws related to labour standards.
Department of Labour and Employment Occupational Safety and Health Centre (OSHC)	OSHC serves as the national authority for research and training on matters pertaining to safety and health at work. It provides the expertise and intervention mechanism to improve workplace conditions in the Philippines. It has dual mandate of protecting Filipino workers against accidents and illnesses and promoting workers' welfare through effective programs that enhance productivity, workers well-being and afford social protection to its client sector.
Department of Health (DOH)-Food and Drug Administration (FDA)	FDA is a regulatory agency under the DOH mandated to ensure the safety, efficacy or quality of health products as defined by RA No. 9711, which include means food, drugs, cosmetics, devices, biologicals, vaccines, in-vitro diagnostic reagents, radiation-emitting devices or equipment, and household/urban hazardous substances, including pesticides and toys, or consumer products that may have an effect on health which require regulations as determined by the FDA. FDA's role in this project will be in coordination with the FPA to ensure safety and standards of the identified POPs and UPOPs alternatives.

Department of Science and Technology (DOST)-Philippine Textile Research Institute (PTRI)	PTRI is an agency under the DOST formed in 1987 and mandated to conduct applied research and development for the textile industry sector. It also undertakes the transfer of completed researches both in the public and private sector. PTRI's role in the project can be in terms of providing training programs on PFOS alternatives to the textile industry and assist in conducting information, and education campaign.
Textile Mills Association of the Philippines (TeMAP)	TeMAP is an association of textile manufacturers including yarns, threads and fabrics. Their activities focus on the identification, review and deliberation on issues such as taxes, incentives, tariffs, etc. with the end purpose of formulating a common stand. They will be instrumental in the project with regards to cooperation in terms of POPs inventory and assessment as well as in the conduct of cleaner production and adoption of BAT/BEP in the sector.
Samahan sa Pilipinas ng mga Industriyang Kimika (SPIK), or the Chemical Industries Association of the Philippines	SPIK was organized by a group of chemical company executives to strengthen the industry's representation in the government, and private markets in order to better contribute to national development. Its membership includes suppliers and importers of chemicals and chemical products, as well as firms engaged in services vital to the industry like logistics, recycling, and disposal of chemicals. In 1996, it launched locally a program called Responsible Care, a global chemical industry initiative aimed to guide the industry in managing chemicals and in protecting and improving the health, safety, and environment of various stakeholders in the industry including their surrounding communities. SPIK will be tapped as industry partners to help implement environmentally friendly alternatives to POPs usage in the chemical industry.
Philippine Plastics Industry Association and other allied groups	These industry groups will partner with the identified pilot facility in implementing BAT/BEP measures for plastics recycling processes.
Philippine Paper Manufacturers Association, Inc (PPMAI)	PPMAI collaborates with DTI and other government agencies in order to implement green strategy in the sector.
Automotive Industry Associ	They serve as key players in the implementation of PRTR and green ch

ations	emistry approach in the automotive industry.
Local Government Units (LGUs)	There will be three targeted pilot areas/LGUs for demonstration activities on recycling and waste facilities in implementing BAT/BEP as envisaged in Component 2. Other LGUs will be involved in training activities and in dissemination of lessons learned from BAP/BEP implementation.
NGOs	NGOs will assist in the multi-stakeholder drive to increase awareness on the sound management of chemicals and their impact on human health and the environment.
Academe	Academic institutions, universities and colleges, research institutions and laboratories will help in evaluation of the efficiency of the technologies for POPs and UPOPs control.
Finance (Local, international and regional development banks, private sector investors and Ministry of Finance)	This group must coordinate with each other and the other stakeholders to devolve the supportive financial infrastructure to the various sectors of chemicals management (recycling, agricultural, etc) , to help ensure that the GEF investment translates to long term improvements in management of POPs in the Philippines.

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

**Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).**

155. It is fully acknowledged that particular attention ought to be given to the connections between gender concerns and chemicals. Namely, women, men and children differ in their physiological susceptibility to the effects of exposure to toxic chemicals. Furthermore, women are particularly influenced by the adverse impact of the hazardous chemicals due to the structure of their reproductive systems. POPs, including PBDEs and U-POPs (dioxins) are particularly harmful due to their capacity to accumulate in body fats and in breast milk, therefore representing a significant risk for women and infants.

156. Usually, risk-based environmental standards and risk-based corrective actions, following a precautionary approach, are designed taking into account the highest risk for the most sensitive and exposed population categories, therefore environmental and toxicological limits already take into account the specific issue of women and infants. Nevertheless, specific awareness raising initiatives will be adopted to further reduce the risk of exposure of women and infants given their specific sensitivity.

157. In the course of the project design, a specific gender mainstreaming work plan, with gender-sensitive targets and indicators, will be developed and integrated in the project results framework. This will include as a minimum the following.

- 1) Availability of gender specific training and awareness raising initiatives;
- 2) Initiatives and rules to ensure equal access to the job opportunities generated by the project;
- 3) Equal access to the information generated by the project;
- 4) Assessment of gender-specific chemical risk associated with POPs and PTS used and/or released by industrial activities and in consumer products.
- 5) Specific health and safety rules for female employees in the waste collection and recycling industries.

158. In addition to that, in the course of project design and implementation, UN policies on equal opportunities will be considered with the purpose to ensure that the project supports women's capabilities and their enjoyment of rights, and women's equal and meaningful participation as actors, leaders and decision makers.

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

**closing gender gaps in access to and control over natural resources;**

**improving women's participation and decision-making; and/or Yes**

**generating socio-economic benefits or services for women. Yes**

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

Yes

#### 4. Private sector engagement

Will there be private sector engagement in the project?

Yes

**Please briefly explain the rationale behind your answer.**

159. This project concept is entirely designed to ultimately achieve impact through private sector end-users activities that will lead to the complete phase-out of POPs in the selected economic sectors. In addition, the Green Chemistry approach relies on private sector innovation on design and application of new products. From the financial side, the access to a competitive loan to implement their investments; from the technical side, the technical assistance needed to develop projects which are compliant with the eligibility criteria established.



## 5. Risks to Achieving Project Objectives

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

160. A preliminary analysis of the project risk and envisaged countermeasures is reported in the table below.

Outcomes	Unfavourable event	Category	Risk before mitigation			Proposed Mitigation	Risk after mitigation		
			Probability	Impact	Risk		Probability	Impact	Risk
1.1	Policy not developed and implemented within project timeframe	Management	H	M	H	Early start on policy work (even at PPG to understand the scope of the policy). Identification of proper regulatory measures which may be approved quickly (i.e. Circulars). Policy guidelines with validity limited to project activities in case the official policy cannot be developed in due timeframe. The project will strictly cooperate with DENR and EMB drafting technical guidance documents, or amendment of existing regulations, ensuring therefore that regulatory activities are carried out smoothly.	L	L	L
1.1	Difficulties arising from the coordination among administrations of different levels (national and barangay levels) and private industry	Management	M	M	M	Representatives of different levels will be involved in the steering committee; the tasks of the PMU will include to ensure communication with all the project partners; roles and composition of each project institution will be clarified and agreed since the inception of the project. UNDP CO will take a role in coordinating stakeholders in case of conflicts using its representative function where needed. EMB and DENR have already established sound cooperation with associations of private industries.	L	L	L

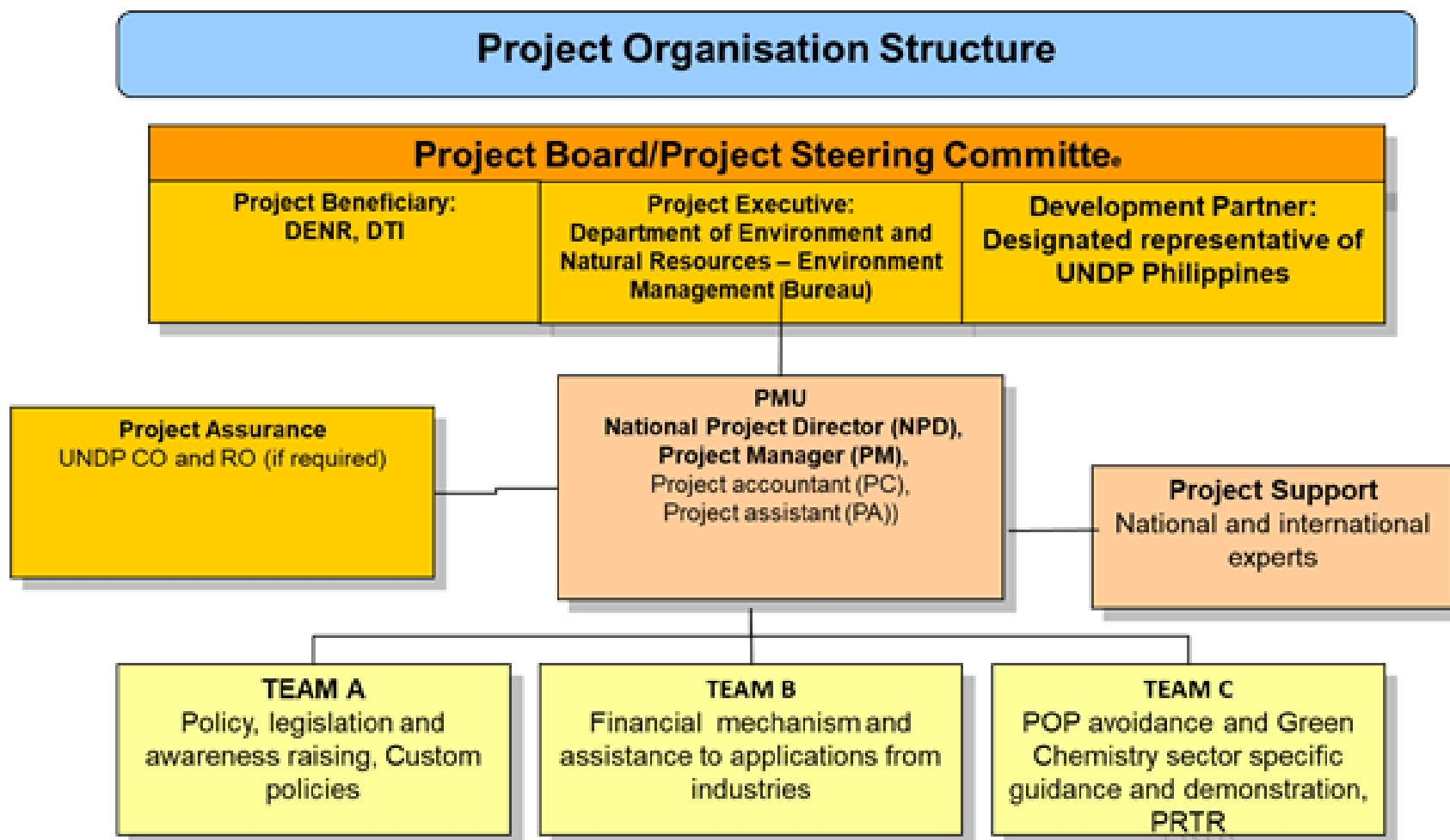
2.1	Industries reluctant to share data on their production processes or to implement POP-free alternatives.	Information	H	M	H	Since PPG stage the project will enhance communication aimed at demonstrating how the use of alternatives to POPs will result in indirect or direct financial benefit, including access to wider international market. Several Industrial stakeholders, bilateral donors and Ministries are already committed to generate and share information. A continuous effort will be paid to this, which is one of the key risks for the project	M	M	L/M
	Cost associated with the implementation of alternative to POPs	Technical and Financial:	M	M	M	Cost/effectiveness of the use of alternative chemicals in industry will be performed in the initial stage of project implementation to achieve awareness and consensus among partners.	L	M	L
	Issues in establishing an effective control of the flow of POPs through borders, limited knowledge on POPs containing chemicals and pesticides of the custom officers and end users.					<p>The project will establish a training and a communication mechanism which will operate at different levels:</p> <p>Technical and legal information for custom officers, including searchable database of chemicals and mixtures containing POPs with commercial names;</p> <p>Existing alternatives and risk associated with the use of POPs for end users (Industrial and agricultural sector, including importers, suppliers, farmers and agribusiness related industries.)</p>			
All	Increased GHG or climate change effect	Climate	L	M	L/M	The project is intrinsically neutral or positive in term of generation of GHG or energy consumption. However, alternative processes / materials will	L	L	L

						alternative processes / materials will be assessed also in term of energy consumption and release of GHG.			
All	Project activity impacted by GHG or climate change	Climate	L	L/M	L/M	As no large infrastructure is envisaged by the project, but only rearrangement of products, materials or industrial processes, no additional risk compared to the baseline is associated with climate change	L	L/M	L/M
All	Gender Mainstreaming activities / goal not conducted or achieved	Social	M	M	M	Philippine is a favorable country in term of GM policies, therefore no structural or cultural obstacle are expected to hinder the GM related project policies and activities. In any case, at PPG a detailed GM logical framework, with budget and indicators, will be integrated in the project. GM targets will be considered as core project targets	L	L/M	L/M
All	Difficulties in evaluating GEB baseline and achievement	Technical	M	M	M	The main difficulties in assessing the GEB baseline will be addressed starting from PPG, with more detailed analysis of the previous use of POPs and POP-like substances in industrial processes. Criteria for the calculation of the reduced GEB consumption and release will be established in detail at PPG. The POP TT and associated attachments already document the criteria adopted. A residual risk on the estimation of POPs cannot be completely eliminated, but adoption of conservative criteria for the estimation will ensure that the GEB at project design are more likely underestimated than overestimated	L	L/M	L/M
ALL	There can be slow delivery	Management	M	H	H	Government and UNDP CO are already	L	M	L

	very by government, and the CO as well as coordination issues which may cause project cancellation if there are time overruns at certain critical milestones.				dy coordinating efforts for project development and implementation and already have established a project unit. The focal point of SC has experience in the implementation of GEF funded POPs project. A project steering committee will be established at PPG stage to ensure that all the operation modalities relevant to project implementation and execution are well understood by all the parties and fully in place			
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## 6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.



160. The project will establish a sound coordination with the following project ongoing or approved by the GEF.

- Vietnam POPS and Sound Harmful Chemicals Management Project (UNDP) (GEF 5067). Although the project is in its final implementation stage, coordination will be ensured with the UNDP and government team who has implemented and piloted the PRTR system in Vietnam, to a better understanding of the lesson learnt during that activity. UNDP CO will therefore held at least one workshop with UNDP Vietnam to share knowledge and coordinating effort on the PRTR side, with the aim to adopt common standards in the development of PRTR database.
- Application of Green Chemistry in Vietnam to Support Green Growth and Reduction in the Use and Release of POPs/Harmful Chemicals (UNDP) (GEF 9379). UNDP is currently implementing a similar project related to the implementation of Green Chemistry in Vietnam. The project is currently piloting Green Chemistry and POPs elimination intervention in 3 industries (biosolvent, paint and chrome plating) and is expected to surpass the committed GEB in term of elimination of POPs. Coordination with this project will be ensured through workshops and online meeting aimed at sharing informations concerning the technologies to be implemented and the regulatory aspects.
- Implementation of PCB Management Programs for Electric Cooperatives and Safe e-wastes Management (UNIDO). (GEF 9078). The project will specifically coordinate with the component related to E-waste management, with the purpose to harmonize the regulatory aspect associated with PFOS and PBDEs and with the purpose to identify consistent technologies for the rapid identification of POPs contaminated waste, and for the disposal of these waste.

## 7. Consistency with National Priorities

**Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions**

Yes

**If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc**

- Stockholm National Implementation Plan (NIP)
- Stockholm National Implementation Plan Update

161. The project is in general consistent with the Country's environmental policy, including among others, the existing regulation concerning chemicals and their wastes (DENR Administrative Order 29 Series of 1992 requiring the registration of chemicals that pose unreasonable risk to public health, workplace and the environment).

162. The Philippine Clean Air Act of 1999, which includes explicit provisions on the reduction and measurement of dioxins and furans releases into the environment from various sources, and sets the standard concentration limit in air for the emission of dioxins and furans at 0.1 nanogram per normal cubic meter (ng/Nm<sup>3</sup>) for treatment facilities using non-burn technologies; and the Republic Act 9003 or The Ecological Solid Waste Management Act of the Philippines, which Through Section 48, prohibits open burning of solid wastes. Industries under the Act are encouraged to adopt pollution prevention/cleaner production measures, which should also assist to reduce or eliminate releases of unintentional POPs.

163. The project is consistent with the priorities and action plan identified under the revised and updated National Implementation Plan, with specific reference to the following:

- Action plan addressing POPs contaminated sites:
- Action plan addressing Unintentional POPs (U-POPs):
- Action plan addressing PBDE management:
- Action plan addressing PFOS management.

## 8. Knowledge Management

Outline the Knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

164. Knowledge management is fully described under Component 4: Knowledge Management & Awareness, Project monitoring, learning, adaptive feedback and evaluation.

## 9. Environmental and Social Safeguard (ESS) Risks

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

Overall Project/Program Risk Classification\*

PIF

CEO Endorsement/Approval MTR

TE

Medium/Moderate

### Measures to address identified risks and impacts

Provide preliminary information on the types and levels of risk classifications/ratings of any identified environmental and social risks and potential impacts associated with the project (considering the GEF ESS Minimum Standards) and describe measures to address these risks during the project design.

Kindly refer to the project's Social and Environmental Screening Procedure (SESP) template.

### Supporting Documents

Upload available ESS supporting documents.



Title

Submitted

6102 PHL PreSESP - Reduction of POPs - FINAL

### Part III: Approval/Endorsement By GEF Operational Focal Point(S) And Gef Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
Atty. Analiza Rebuelta-Teh	Undersecretary & GEF Operational Focal Point for the Philippines	DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES	

**ANNEX A: Project Map and Geographic Coordinates**

Please provide geo-referenced information and map where the project intervention takes place

A map will be developed at the PPG stage.