



## Reduce the impact and release of mercury and POPs in Vietnam through lifecycle approach and Ecolabel

### Part I: Project Information

#### GEF ID

10519

#### Project Type

FSP

#### Type of Trust Fund

GET

#### CBIT/NGI

☐ CBIT

☐ NGI

#### Project Title

Reduce the impact and release of mercury and POPs in Vietnam through lifecycle approach and Ecolabel

#### Countries

Viet Nam

#### Agency(ies)

UNDP

#### Other Executing Partner(s)

#### Executing Partner Type

**Other Executing Partner(s)**

Ministry of Natural Resources and Environment (MONRE)

**Executing Partner Type**

Government

**GEF Focal Area**

Chemicals and Waste

**Taxonomy**

Focal Areas, Chemicals and Waste, Sound Management of chemicals and waste, Plastics, Industrial Emissions, Mercury, Emissions, Disposal, Waste Management, Hazardous Waste Management, Green Chemistry, Persistent Organic Pollutants, Unintentional Persistent Organic Pollutants, New Persistent Organic Pollutants, Best Available Technology / Best Environmental Practices, Influencing models, Transform policy and regulatory environments, Demonstrate innovative approach, Deploy innovative financial instruments, Strengthen institutional capacity and decision-making, Convene multi-stakeholder alliances, Stakeholders, Type of Engagement, Information Dissemination, Participation, Consultation, Partnership, Local Communities, Beneficiaries, Private Sector, SMEs, Financial intermediaries and market facilitators, Capital providers, Large corporations, Civil Society, Academia, Communications, Awareness Raising, Behavior change, Public Campaigns, Education, Gender Equality, Gender Mainstreaming, Women groups, Sex-disaggregated indicators, Gender-sensitive indicators, Gender results areas, Access to benefits and services, Knowledge Generation and Exchange, Capacity Development, Participation and leadership, Capacity, Knowledge and Research, Learning, Adaptive management, Indicators to measure change, Knowledge Generation, Enabling Activities, Knowledge Exchange, Innovation

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

Climate Change Mitigation 0

**Climate Change Adaptation**

Climate Change Adaptation 0

**Duration**

48 In Months

**Agency Fee(\$)**

437,005

**Submission Date**

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CW-1-1	GET	4,600,050	28,550,000
	Total Project Cost (\$)	4,600,050	28,550,000

**B. Indicative Project description summary**

**Project Objective**

The objective of the project is to protect human health, environment and promote sustainable production and consumption through the reduction of the use of POPs, new POPs and mercury and the release of POPs, U-POPs and mercury throughout the entire lifecycle in key industrial sectors supported by EcoLabel system, Green Financing and Procurement mechanisms.

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
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Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 1: Promote sustainable production - consumption in key sectors through Ecolabeling, Green Financing and Procurement, and other elements to support a long-term Innovation Ecosystem for greening the value and supply chain across sectors.	Technical Assistance	<p><b>1.1</b> Environmental regulation upgraded to include new POPs; Ecolabel and related policies developed and implemented.</p> <p><b>1.2</b> Environmental policy on mercury developed and implemented to replace mercury products and to enhance the management of products containing mercury at their End of Life with segregation of mercury and recycling of non-mercury components.</p> <p><b>1.3</b> Development of a Green Finance Framework, to sustain the shifting of enterprises toward a non-POPs and a non-Mercury</p>	<p><b>1.1.1</b> Review, amendment of existing, or creation of new legislation related to POPs and new POPs in key sectors (e.g. plastic and polymers, metal plating, paint/solvents, etc.), including ensuring inclusion of provisions to support, inter alia, prohibition of import for new POPs; concentration limits for POP brominated flame retardants, HBCD, SCCP and other POPs/PTS in products and waste; development of Ecolabeling schemes; New EPR schemes developed and enforcement of existing EPR schemes improved.</p> <p><b>1.2.1</b> Roadmap and sectorial plans for the replacement of mercury thermometers and mercury containing lamps established.</p> <p><b>1.2.2</b> Review of the existing legislation related to mercury in products and mercury emission carried out, to help develop, strengthen, and ultimately enforce regulations concerning technical standards for mercury waste management.</p> <p><b>1.3.1</b> Green Finance framework designed, funded and implemented to support private sector having access to incentive policies (tax, fee reduction.). Ecolabeling improved, funded and properly communicated, building on</p>	GET	900,000	4,000,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 2: Life cycle management of POPs and PTS containing products.	Technical Assistance	<p><b>2.1</b> Sustainable manufacture and design of plastic, polymers, paint, metal finishing and other products improved to prevent the use of POP and the release of POP and mercury in the environment.</p> <p><b>2.2</b> Closure of the gap between recyclers and industry to sustain circular economy and to prevent the contamination of recyclable materials.</p>	<p><b>2.1.1</b> Analysis of the manufacturing sectors for which the use of new POPs has been recently confirmed but not yet included in the NIP carried out, in order to strengthen baseline and select optimum sectors and enterprises for pilot activity to improve POPs management in the value chain.</p> <p><b>2.1.2</b> Alternative product design to prevent the use of hazardous chemicals additives in general and consequently the use of POPs (e.g. BFR, HBCD, PFOS/PFOAs, SCCP) in at least 2 key sectors demonstrated (tentatively plastic-foam and paint).</p> <p><b>2.1.3</b> Design and implementation of modern Air Pollution Control Systems to prevent the release of mercury and U-POPs suitable also for small enterprises carried out (tentatively in the sectors of waste incineration and ferrous and non-ferrous metal recycling).</p> <p><b>2.2.1</b> Interaction, technical exchange and commercial agreements between recyclers and industry promoted to identify and implement solutions for the horizontal and safe recycling of materials and for the segregation and safe disposal of POPs contaminated materials.</p>	GET	1,840,000	12,000,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 3: Mercury lifecycle management of mercury containing products.	Technical Assistance	<b>3.1</b> Replacement of mercury products with non-mercury products promoted and sustained by EPR schemes and EOL management.	<p><b>3.1.1</b> Risk Management Strategy, technical guidance and training materials developed for the sound management of mercury stockpiles and obsolete mercury-containing equipment, with specific reference to mercury lamps and medical devices.</p> <p><b>3.1.2</b> Capacity and institutions are strengthened to eliminate use of mercury containing products (e.g. Mercury lamps, thermometers and cosmetics) at least 50 medical facilities; road map and plan for using of mercury-free devices developed and implemented (20,000 mercury thermometers replaced)</p> <p><b>3.1.3</b> Technologies for the recycling of mercury containing equipment (fluorescent lamps, medical devices) with segregation and storage of mercury established.</p>	GET	1,450,000	11,750,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 4: Monitoring and Evaluation.	Technical Assistance	4.1 Monitoring and evaluation of the project.	<p>4.1.1 Project and its activities monitored and evaluated on a periodic basis in line with GEF, UNDP and government requirements.</p> <p>4.1.2 Indicators established to facilitate successful project implementation and sound impact assessment.</p>	GET	200,000	800,000
Sub Total (\$)					4,390,000	28,550,000
Project Management Cost (PMC)						
					210,050	
Sub Total(\$)					210,050	0
Total Project Cost(\$)					4,600,050	28,550,000



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

<b>Sources of Co-financing</b>	<b>Name of Co-financier</b>	<b>Type of Co-financing</b>	<b>Investment Mobilized</b>	<b>Amount(\$)</b>
Private Sector	Various enterprises (direct investment)	Grant	Investment mobilized	14,000,000
Government	Vietnam Environment Protection Fund	Grant	Investment mobilized	2,000,000
Government	Vietnam Environment Administration	In-kind	Recurrent expenditures	2,225,000
Government	Vietnam Environment Administration	Grant	Investment mobilized	925,000
Government	Ministry of Industry and Trade	Grant	Investment mobilized	300,000
Government	Ministry of Health	Grant	Investment mobilized	300,000
Government	Local Government	Grant	Investment mobilized	2,500,000
Government	Local Government	In-kind	Recurrent expenditures	1,300,000
Private Sector	Various enterprises (Green Loan subscription)	Grant	Investment mobilized	5,000,000
<b>Total Project Cost(\$)</b>				<b>28,550,000</b>

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

The project will develop a Green Financing Framework, consisting in: 1) eligibility criteria for projects to be submitted by the industry, to be established under the project in compliance with Stockholm and Minamata convention; 2) Investment mobilized from private sector of 19,000,000 USD, for supporting projects submitted by the industries, disbursed with a competitive interest rate (around 2.5%); 3) a grant covering 10% 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. It is expected that, given the above favourable conditions, and the stricter regulations enacted by the Government of Vietnam (GOV) on POPs and mercury, the available fund placed under the Green Financing Framework will be completely booked very quickly through the projects submitted by the industry. Therefore, the combined financial support ensured through the reduced interest rate provided by the Green Financing entity, the technical assistance, and the GEF grant of 1,500,000 USD will mobilize investment from industries for an overall amount of

19,000,000 USD. The project envisages mobilization of capital for an amount of around 2,925,000 USD from MONRE (VEA+VEPF), recurrent expenditure from VEA up to 2,225,000 USD, plus a more limited amount coming from MOIT and MOH (300,000 USD each). As indicated in the PIF, Vietnam is quite keen on investment on POP management. The PM approval of National Target Program (NTP) in 2018 at Decision No. 807/QĐ-TTg allocates 20 million USD cash for cleanup of POP contaminated sites. Investment on monitoring is significantly increasing. Vietnam Chemicals Agency (Vinachemia) under MOIT is now implementing activities for reduction and phasing out of Mercury used products and manufacturing process. Vinachemia is planning to develop a draft Decree for implementation of Minamata Convention in Vietnam. Similarly in MOH, Health Environment Management Agency (VIHEMA) also looks forward to eliminating the use of mercury health devices in the sector and have been carrying out some initial training and public awareness raising on the harm from mercury contained products and phasing out the use of mercury amalgam. Specific details on the implication of these activities on investment mobilization, currently estimated conservatively in 300,000 USD for MOIT and 300,000 USD for MOH, will be provided at PPG stage. On the side of MONRE, the VEPF (Vietnam Environmental Protection Fund), as a department of the Ministry of Natural Resources and Environment, is at the core of the state financial strategy for the implementation of environmental projects. The VEPF holds a total chartered capital of VND 1 trillion (approximately USD 43.15 million), including VND 727 billion (approximately USD 31.38 million) allocated by the state budget, and now has submitted the Plan to the Government to raise the chartered capital to VND 2 trillion during the period 2020-2021. Access to this fund is currently granted to eligible environmental activities, established under the Annex III of Decree No. 19/2015/ND-CP dated 14/02/2015, amended at Decree No. 40/2019/ND-CP guiding implementation of Vietnam Environmental Protection Law.

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	Viet Nam	Chemicals and Waste	POPs	4,600,050	437,005	5,037,055
Total GEF Resources(\$)					4,600,050	437,005	5,037,055

E. Project Preparation Grant (PPG)

PPG Required

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PPG Amount (\$)

150,000

PPG Agency Fee (\$)

14,250

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNDP	GET	Viet Nam	Chemicals and Waste	POPs	100,000	9,500	109,500
UNDP	GET	Viet Nam	Chemicals and Waste	Mercury	50,000	4,750	54,750
Total Project Costs(\$)					150,000	14,250	164,250

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)
35.01	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)
<b>Select</b> Short-chain chlorinated paraffins (SCCPs)	8.00			<input type="checkbox"/>
<b>Select</b> Hexachlorobutadiene (HCBd)	10.00			<input type="checkbox"/>
<b>Select</b> Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	7.00			<input type="checkbox"/>
<b>Select</b> Hexabromodiphenyl ether and heptabromodiphenyl ether	10.00			<input type="checkbox"/>

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)
0.01			

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)

<b>Number (Expected at PIF)</b>	<b>Number (Expected at CEO Endorsement)</b>	<b>Number (Achieved at MTR)</b>	<b>Number (Achieved at TE)</b>
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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)

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

<b>Metric Tons (Expected at PIF)</b>	<b>Metric Tons (Expected at CEO Endorsement)</b>	<b>Metric Tons (Achieved at MTR)</b>	<b>Metric Tons (Achieved at TE)</b>
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30,000.00

**Indicator 10** Reduction, avoidance of emissions of POP to air from point and non-point sources (grams of toxic equivalent gTEQ)

<b>Grams of toxic equivalent gTEQ (Expected at PIF)</b>	<b>Grams of toxic equivalent gTEQ (Expected at CEO Endorsement)</b>	<b>Grams of toxic equivalent gTEQ (Achieved at MTR)</b>	<b>Grams of toxic equivalent gTEQ (Achieved at TE)</b>
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**Indicator 10.1** Number of countries with legislation and policy implemented to control emissions of POPs to air (Use this sub-indicator in addition to Core Indicator 10 if applicable)

<b>Number (Expected at PIF)</b>	<b>Number (Expected at CEO Endorsement)</b>	<b>Number (Achieved at MTR)</b>	<b>Number (Achieved at TE)</b>
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1

**Indicator 10.2** Number of emission control technologies/practices implemented (Use this sub-indicator in addition to Core Indicator 10 if applicable)

<b>Number (Expected at PIF)</b>	<b>Number (Expected at CEO Endorsement)</b>	<b>Number (Achieved at MTR)</b>	<b>Number (Achieved at TE)</b>
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5

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

	<b>Number (Expected at PIF)</b>	<b>Number (Expected at CEO Endorsement)</b>	<b>Number (Achieved at MTR)</b>	<b>Number (Achieved at TE)</b>
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<b>Female</b>	800,000
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<b>Male</b>	800,000
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	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
<b>Total</b>	1600000	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

**Indicator 9: Around 35 tons of POPs (from direct or indirect avoidance of the use of POPs in processes and products and the safe disposal of POP contaminated materials); a maximum of 648 kg of mercury emission avoided, 10,2 kg of mercury from thermometers and lamps. POPs type: PFOA, PFOS and salts, c-PBDE, HBCDD and SCCP. In addition, 500 tons of waste/materials containing industrial POPs would be prevented or disposed of. Indicator 9.6 - Quantity of POPs/Mercury containing materials and products directly avoided = 30,000 Metric Tons (20,000 mt from Mercury lamps and 10,000 mt from Mercury thermometers). Indicator 11: A significant part of the project is oriented towards amending or creating legislation/frameworks/etc. to promote sustainable production at a high level, and assisting enterprises from multiple sectors in making their production processes more environmentally friendly. As such, the direct beneficiaries of this project, besides the enterprises themselves, will be the many men and women whose communities are close to facilities across Viet Nam that currently emit high levels of POPs and/or mercury into the environment, and whose lives and livelihoods will be improved by a shift to the greener alternative products and processes that will be encouraged by the project.**

## Part II. Project Justification

### 1a. Project Description

#### **A) The global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description)**

The EU risk assessment documents and the Stockholm Convention Risk profiles identify, among others polymers plastic and paint manufacturing as potential use sectors for POPs Brominated Flame Retardants, (including PBDEs, HBCD), PFOS/PFOAs and SCCP. New POPs, like PFOS and SCCP are also used in other manufacturing sectors, like the electro-plating industry and the paint manufacturing industry. Under the “Application of Green Chemistry in Viet Nam to support green growth and reduction in the use and release of POPs/harmful chemicals”, currently under implementation by the Ministry of Industry and Trade and UNDP, the replacement of POPs chemicals (SCCP and PFOS) through process change or product design in hard-plating and painting industry is being currently demonstrated. The evidence brought by the Green Chemistry project is that the use of these chemicals in this industrial sector may be quite widespread. Based on the data reported on the Vietnam Yellow Pages, for instance, in Vietnam, there are around 150 plating industry out of which around 30% are chrome plating. Based on the preliminary result of the “Green Chemistry project”, one medium size chrome plating industry may use around 0.6 tons of PFOS/year. Upholstery, which may be considered as a downstream sector for both plastic and textile, may have specific use of both flame retardants (applied to reduce the flammability of Poly-Urethane Foam used in pillows and mattresses) and PFOS / PFOAs (applied to reduce the permeability of the fabric).

The production of some of these POPs (for instance the commercial penta and octa-PBDE mixtures) have been discontinued since the early year 2000; but others (like deca-BDEs, PFAs, HBCD, SCCP) were still produced in large quantities until recently, or are still manufactured and commercialized as additives in industrial processes, the manufacturing of paint, plastic components, polymers (like extruded and expanded polystyrene), foam and special purpose textiles and upholstery. Technical regulations for instance, require that certain types of poly-urethane foams used in mattress, sofas, insulating materials, automotive seats etc. fulfil specific low-flammability standards, which at present, can only be achieved through their mixing or wrapping with flame retardants. Rubber-chlorinated paint makes wide use of SCCP in their formulation. The use of PFOS as mist suppressant is considered as an “allowed use” under the Stockholm Convention, provided that they are used in a “closed-loop” process; however, currently all the hard-plating or chrome-plating processes in Vietnam is carried out as open processes. The evidence that these chemicals are dangerous for the health and the environment, has led to consumer concerns, with attendant prioritization of initiatives aimed at chemical replacement, mandating intrinsic safety of materials and products, shifting toward natural fibers etc.

Based on the Stockholm Convention risk profiles, around 18,000 tons of HBCD were produced in 2010; around one million tons of chlorinated paraffins (inclusive of SCCP species not entirely classified as POPs) were produced in 2009. 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.



Although in Vietnam industrial POPs chemicals like PBDEs, PFOS, HBCD, SCCP were never produced, some of these substances (like deca-BDE and HBCD) have been imported until 2016 and others (SCCP, PFOS) are still imported for use as additive in manufacturing processes, and are currently still present in material and in articles in use or at their end of life stage.

The contamination by mercury and POPs is currently hindering a full development of circular economy in Vietnam due to the fact that material potentially contaminated by POP and mercury is unsafe for reuse or recycling into new products.

A significant amount of these chemicals, still present in Vietnam either in articles or products being used, in end of life articles, or in waste, represents both a local and a global problem, as it is well known that both POPs and mercury have the capacity to be transported globally to very large distance. This is specifically true for tropical areas like Vietnam, where POPs or mercury compounds can easily evaporate, be entrapped in atmospheric streams, and condensed far away in regions where the temperature are lower. What is more, export of products presents a clear and present route to (re)distributing chemicals contaminants.

As recycled material (particularly plastic, as the amount of recycled yarn is minimal (some craft villages near Hanoi and HCM city to collect these scraps and make pillows, quilted blankets, clothes for children. And of course, some non-reuseable will go to landfill or incineration) is not checked for the presence of POPs, these substances may re-enter the cycle through the use of low-quality recycled material in the manufacturing sector. The plastic which is not considered recyclable by the recycling industry is often dumped in the environment, burnt in the open or used as secondary fuel, with the associated release of POPs and chlorinated and brominated dioxins and furans.

The following are the main barriers hindering the segregation of POPs and mercury containing material and waste, and their disposal in an environmentally sound way:

- Beside still having significant gaps concerning the regulation of new POPs and mercury, the relevant legislation on chemical and waste is not properly enforced yet;
- There are no quality standards (either voluntary or mandatory) or certification processes to promote the use of BFR free plastic, with the result that some POPs substances may easily reenter from the back-door of plastic recycling;
- The recycling procedures are mostly carried out through elementary processes in recycling villages, without any procedure to segregate contaminated plastic, resulting in the release of U-POPs in the environment and in the cross-contamination of plastic;
- There is a gap of communication between recyclers and manufacturers due to their different organisational features and lacking of technical knowledge;
- There are no procedures or technologies in place to ensure that mercury containing waste are segregated and processed in an environmentally sound way.
- There is a very low awareness of potential presence of POPs chemical in some plastic and polymer articles and the associated risk of the risk for the health and the environment.

## **B) The baseline scenario or any associated baseline Programs.**

### **Baseline scenario**

In Vietnam a number of regulations concerning the phasing out of POPs, the management of POPs containing waste and the maximum allowable concentration of POPs in soil and food chain. However, technical guidelines for environmental levels of some new POPs such as PBDEs, HBCD, HCB, PFOS, PFOSF and HBB are still missing. A commented summary of some recent regulations on chemical in Vietnam, including their relevance to POPs is reported in the table below.

The national technical regulation on the remediation target values for persistent organic pesticides according to land use (QCVN 54:2013/BTNMT) was developed under the UNDP/GEF project on pesticide disposal in Vietnam.	It was the first national technical regulation of this type, and is a milestone in establishing standard rules for the remediation of sites contaminated by POP pesticides in Vietnam.
In 2017, the Ministry of Natural Resources and Environment Vietnam issued circular 24/2017/TT-BTNMT to set official environmental monitoring techniques and methods, including some POPs	This is a new circular combining several previous circulars on environmental monitoring activities covering also POPs. It however does not contain yet provisions for monitoring techniques of new POP such as PBDE, PFOS, HBCD.
The Decision N°16/2015 does make provision to regulate the end of life collection of products like vehicles, tires, electronic devices, oil, batteries, for a more efficient recycling of materials.	This regulation may constitute a valuable resource for setting up an environmentally-sound recycling scheme, with benefits also on the reduced release of POPs. The enforcement of this decision is however still very low.
Decision No. 184/2006/QĐ-TTg, and its update, Decision 1598/2017/QĐ-TTg, as well as QCVN07/2009/BTNMT on hazardous waste.	Under these regulations, PCBs and HCB are listed among the banned or restricted substances
QCVN 15/2008/BTNMT	Include maximum allowable concentration of HCB in soil
Circular 30/2011/TT-BCT dated 10th August 2011 of Ministry of Commerce and Trade	Provides temporary allowable concentrations of some toxic chemicals in electric, electronic products. Toxic chemicals concerned are POP Polybrominated biphenyl (PBB) and Polybrominated diphenyl ethers (PBDE). However, this is temporary for such a circumstance by the time to meet international requirement of import/export. The Circular needs to be updated and supplemented with further substances and should be scientific-based approach.

#### POP in the plastic industry and recycled plastic.

The Vietnam plastics industry is still a relatively new sector compared to the other more traditional sectors; however based on figures from sector associations[1]<sup>1</sup>, it has an annual estimated growth rate of 16 to 18 per cent, with around 2,200 plastics companies delivering plastic components for sectors like power, electronics, telecommunication, communication and transportation, aquatic products, agriculture, etc.

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[1] <http://plasticsvietnam.com/news-media/press-releases/plastics-rubber-vietnam-2018-boasts-significant-business-opportunities-for-vietnams-thriving-markets.html>

Domestic plastic producers use about 5 million tons of input raw materials (petrochemicals from crude oil, pelletized polymers, or recycled plastic) for production flows and activities. Currently (2016), domestic market only provides around 900,000 tons of raw materials and additives because of underdeveloped petrochemical industry, plastic recycling industry, which could meet only 20-30% of material demand, meanwhile, there is no exact statistics on the number of plastic recycling business (Source: Vietcom Bank Securities, Vietnam Plastic Report 2016).

The information on the use of POPs, and namely PBDEs and SCCP in the plastic sector in Vietnam is, however, scarce, and mostly based on indirect information (i.e. NIP estimates based on the UNEP guideline). Notably, a guideline for the inventory of SCCP is still missing, and indeed the use of indirect statistics to calculate the amount of PBDE in end of life products generates quite uncertain estimates. Evidences show that deca-PBDE was officially imported in Vietnam until 2017, and that products treated with deca-BDE were commercialized until recently.

In the plastic industry, Deca-BDE is contained as a flame retardant in plastics at a level which may exceed 5% of the product's weight. Arguably, flame retardants are only used when technical specifications of the component/articles require the compliance with flame-retardant standards, like in the automotive, power or electronic sectors. Most of the plastic recyclers or manufacturers don't have a clear understanding of the identity of chemical additives used in their processes.

A large amount of plastic is recycled informally in recycling villages, where the different plastic categories are separated manually with uncertain degree of effectiveness, and the non-recyclable plastic is often either burnt in the open, in brick factories or simply dumped, with release in the environment of pollutants like PBDEs and U-POPs. This unsafe procedure brings concerns even on the true sustainability of plastic recycling. The plastic recycled in this way cannot access quality market for the production of plastic articles, and stays within a chain of small manufacturers with little quality control, so that POPs PBDE and other pollutants contained in plastic remain in the cycle until they are improperly disposed in the environment.

Like other South East Asian countries, due to the poor management of waste, Vietnam lives the paradox of an excessive use and production of plastic, and the simultaneous shortage of good plastic scrap to feed its plastic industry. The Chinese ban to the import of plastic waste put Vietnam and other SEA countries under the pressure of plastic waste exporters. Obviously, the plastic waste which reach the Vietnamese ports is more on the side of low-quality plastic as western generator of plastic waste tends to keep high quality

plastic waste into their own production cycle process. As the Vietnamese petrochemical industry can only cover 20% of the plastic industry demands. The Vietnamese government is allowing imports of plastic waste specifically to serve the domestic plastics industry until December 31, 2024. In this period, therefore, there is urgent need to improve the management of plastic waste to ensure there is enhanced circularity promoted, with more recycled plastic sourced for the Vietnamese industry, and to establish standards and procedures to check the quality of imported plastic waste, with specific reference to POPs.

### **POPs in other manufacturing sectors.**

The use of PFOS and Short Chain Chlorinated Paraffins (SCCP) have been recently confirmed in Vietnam by industries participating in the project “Application of Green Chemistry in Viet Nam to support green growth and reduction in the use and release of POPs/harmful chemicals” Although figures are still preliminary, evidences showed that the consumption of PFOS in a medium size hard-plating factory may be in the order of 0.6 / tons year, whilst the consumption of SCCP in the formulation of chlorinated paint reached 3.5 tons/year in a medium size paint manufacturing industry. Information on the number of industries operating in these 2 sectors is not available, and there is a large heterogeneity of processes.

It is likely that a significant amount of POPs is also used in the building sector, and more precisely in the manufacturing/import of Expanded or Extruded Polystyrene (EPS/XPS) as insulating materials. Based on a report from BCRC Asia, in the year 2018 there were around 110 companies manufacturing XPS and EPS panels/sheets in Vietnam. The average production capacities of the companies was around 100 – 200tons/year. All XPS and EPS materials are imported from Taiwan. Currently, there are no alternative to HBCD in the manufacturing of EPS, therefore is likely that a large part of this material is treated with HBCD.

### **Data in the POPs and mercury inventory in Vietnam.**

#### **PBDE**

The NIP estimated that around 100,000 tons of PBDE-contaminated plastics are present in Vietnam in the EEE / WEEE sector, with an equivalent amount in the automotive and ELV sector. As such, one can conclude there is a risk that recycling of materials coming from these sectors could represent a health and environmental issue in the absence of procedures for the verification of POP contamination. This estimation has not yet included the presence of deca-BDE, which was listed under the Annex A of the POPs convention only recently (see the Vietnam NIP updated in 2017).

PFOS - Based on the NIP estimates, PFOS stockpiles are associated mostly in textile and upholstery (0.15 to 3.45 tons), paper and paperboard (0.2 to 4.8 tons), chemicals (for instance as varnish remover, 0.062 tons) and firefighting foam (from 10 to 15 tons). However, these estimates are very uncertain, and it is not possible to track back PFOS stockpile for their disposal, therefore the only option is to monitor the presence of these chemicals near potential sources, and prevent their import and use. According to the 2017 NIP, there are nearly 150 establishments working in metal plating, of which about 30% are involved in chrome plating.

In addition, there are metal plating facilities at household scale which have not been registered. These establishments are potential sources of PFOS emission, and a survey conducted in 2015 by Hanh Thi Duong *et al* [1] has found the existence of PFOS in water bodies near industrial sites. The greatest concentrations of PFOA (53.5 ppt) and PFOS (40.2 ppt) were found in a surface water sample collected from a channel that receives wastewater treatment plant discharges. PFOS and PFHxS were found as the predominant PFAS substances in sediments. [2]

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[1] Hanh Thi Duong, Kiwao Kadokami, Hanako Shirasaka, Rento Hidaka, Hong Thi Cam Chau,

Lingxiao Kong, Trung Quang Nguyen, Thao Thanh Nguye, (2015) Occurrence of perfluoroalkyl acids in environmental waters in Vietnam. Chemosphere 122 (2015) 115–124.

[2] IPEN - Information about PFAS in Vietnam from 2014 –2018. Online at “[http://www.nature.org.vn/en/wp-content/uploads/2019/05/Pan\\_pfas\\_vietnam\\_15March2019.pdf](http://www.nature.org.vn/en/wp-content/uploads/2019/05/Pan_pfas_vietnam_15March2019.pdf)”

### **PFOAs**

PFOAs have been recently added to the Annex A of the Stockholm convention, and no information is available at this time on the presence of this class of chemicals in articles or waste; although information does exist on the level of contamination found in surface water, groundwater, soil, sediment, sludge, wastewater and even fish. In-depth data on the weight of each group of articles and chemicals containing PFOS, as well as data on concentrations of PFOS is needed.

There are no consolidated and reliable estimates related to the presence of SCCP, HBCD and HCBD in Vietnam. Although listed in the Annex A from 2013 to 2017, these substances have not been assessed in the 2017 NIP, which however included a plan for their management and control.

### **Mercury**

The existing legislation still does not envisage the phasing out of mercury products, like medical devices and fluorescent lamps. However, the Vietnamese government has supported the use of LED lighting through two major projects - Vietnam Energy Efficient Public Lighting Project (VEEPL) and Vietnam National Energy Efficiency In Vietnam, LED technology was first introduced in traffic lights and the advertisement industry. Across Vietnam, incandescent bulbs, especially in street lighting, are being replaced with LED bulbs. The light emitting diode (LED) market in Vietnam is expected to grow at a compound annual growth rate (CAGR) of 18.2 per cent from 2016-2022, reaching \$729 million by 2022, according to the report “Vietnam LEDs market – drivers, opportunities, trends & forecasts: 2015-2022”.

The lighting segment is expected to make the largest contribution to economic growth due to the entry of large multi-national companies, decreasing LED prices, and industrial development of the Vietnamese market.

Many international players have already established factories in the country. Some of the more prominent players in the Vietnam LED market are Osram, New Light LED Technology Ltd, Viribright.

Based on the above, it is evident that Vietnam is preparing the shift from CFL to LED which will be further driven by the need to comply with the requirement of the Minamata convention.

Although, in many hospitals, mercury devices have been replaced by electronic devices, the use of mercury thermometers is still very common. Mercury thermometers are commonly available in pharmacies all around the country, and are perceived as being more accurate comparing to electronic thermometers. The awareness on the danger associated with mercury thermometers in case they break is still very low, several hospital and clinics are not equipped with mercury spill kits, and in case of replacement of mercury devices, a strategy for the collection and safe disposal of these devices is missing.

As of now, the regulation only establishes the maximum allowable amount of mercury in fluorescent lamps. The only mercury containing waste currently regulated are medical waste, under the Joint Circular No. 58/2015/TTLT-BYT-BTNMT dated December 31, 2015 of the Ministry of Health and the Ministry of Natural Resources and Environment regulates medical waste management, including mercury devices. The disposal of hazardous waste in general, and medical waste containing mercury in particular, is carried out according to provisions of Circular No. 36/2015/TT-BTNMT dated June 30, 2015 of the Ministry of Natural Resources and Environment on hazardous waste management. Circular No. 36/2015/TT-BTNMT dated June 30, 2015 of the Ministry of Finance and Environmental on hazardous waste management define clearly the responsibility of waste source owners for the collection, transport and dispose of hazardous wastes.

However, in practice, the classification, collection, storage and treatment of medical waste containing mercury in health facilities is still inadequate due to lack of equipment and awareness by waste source owners. Moreover, the fact that there are no general regulations for the management of mercury containing waste, has resulted in the persistence of improper segregation and disposal of such waste, with-mercury entering the general environment and food chain. End-of-life fluorescent lamps and mercury thermometers are easily dumped in municipal landfills and illegal dumping sites. Based on the Vietnam Minamata Initial Assessment, around 21,000 fluorescent tube lights and 72,000,000 compact fluorescent lamps have been imported in Vietnam in 2016 and 2014, respectively. However, the market for fluorescent lamps is progressively shrinking, as the production and use of mercury containing lamps is being phased out worldwide. The expected release of a huge amount of end-of-life fluorescent lamps in the coming year has not yet addressed by an accompanying prioritization of the development of proper waste management technologies to prevent release of mercury contained in discarded bulbs to the environment.

**Emission of mercury and U-POPs.** The legislation on mercury emissions is also incomplete. Emission limits for mercury emissions have been established for incinerators (QCVN 30:2012/BTNMT, QCVN 02:2012/BTNMT) and cement kilns burning waste (QCVN 41:2011/BTNMT). However, there are no specific rules to limit the emission of mercury from industrial sectors like power plant, cement kilns, incinerators, non-ferrous and ferrous steel works, etc. Based on the sampling and analysis work carried out under the GEF/UNDP POPs and Sound Harmful Chemicals Management Project (PHCM) project, it has been estimated that power plants release around 5,077 kg Hg/year, waste incineration activities release 10,613.3 kg Hg/year, non-ferrous metal production: 2,691 kg Hg/year and cement production: 9,402 kg Hg/year.

In terms of emission intensity, recent sampling and analysis carried out under the UNDP/GEF project on chemical management<sup>[1]</sup> at industrial facilities (power plants, incinerators, cement kiln and non-ferrous metal plants), has shown that the mercury concentration at the stack exceeds international (EU) reference standards in incineration facilities, power plants and non-ferrous metal plants.

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[1] Vietnam POPS and Sound Harmful Chemicals Management Project, GEF 5067

These data are of concern, and the implementation of better Air Pollution Control Systems (APCSs) and control of fuel and raw material could have a significant impact in the reduction of mercury release in the environment. However, industry has no motivation to invest in such equipment until a proper regulation is not in place and properly enforced.

Concerning **U-POPs**, based on the updated NIP inventory, which utilized statistical data of industrial sectors and UNEP toolkit emission factors, the waste incineration sector still accounts for the largest amount of release of PCDD/F in the environment (288g/Teq in the air and 178 g/Teq in the waste). The metal industry contributes an overall amount of 48g/Teq, and cement production with 18g/Teq.

Recent sampling and analysis carried at the stack of waste incinerators and industrial plants in the Binh Duong province under the aforementioned UNDP/GEF project, revealed that 8 out of 9 incineration plants have Dioxin/Furan flue gas concentrations exceeding 1.23 - 40 times the regulatory limit of 0.6 ngTeq/m<sup>3</sup> set by QCVN 30:2012/BTNMT, and Metal production facilities have PCDD/F level of 2.18 - 2.57 times higher than the regulatory limit of 0.6ngTeq/Nm<sup>3</sup> set by QCVN 51:2013/BTNMT. Considering that the regulatory limit is already 6 times higher than the recommended Stockholm Convention BAT value, these data are obviously worrisome.

### **Baseline associated projects.**

Action Plan on sustainable production and consumption. The Prime Minister recently ratified a 2020-2030 national action plan on sustainable production and consumption (under Decision 76/QĐ-TTg dated 11 January 2016), which is in need of enforcement and implementation support. The Prime Minister has assigned MONRE and MOIT to be main players to implement the Plan. Therefore, activities in the Component will provide support to MONRE and MOIT in meeting the needs in the Plan.

The Vietnam Environmental Protection Fund (VEPF). VEPF is a state-owned financial organization established by the government. The VEPF holds total chartered capital of VND 1 trillion (approximately USD 43.15 million), including VND 727 billion (approximately USD 31.38 million) allocated by the state budget. One of the main activities of the VEPF is to provide financial support for environmental protection, biodiversity, projects and activities at national, inter-sectoral and inter-regional levels, including environmental pollution prevention and recovery, or severe local environmental issues. Activities of financial support provided to businesses involved in the project shall include: preferential loans, preferential interest rates, and grants<sup>[1]</sup>.

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[1][1] Considering that MONRE/VEPF is very proactive in promoting its activities, and considering at the same time the quite fast development and internationalization of the manufacturing sectors in Vietnam, and the impact of the Green Chemistry project, it may be that at PPG, increased opportunity for co-financing due to the higher request of preferential loans and grants would emerge.

VEPF is currently revising the “List of environmental protection activities eligible for preferential support” under Annex III of decree No. 19/2015/ND-CP dated 14/02/2015. The draft Annex III currently includes the following:

1. Centralized treatment of domestic wastewater with design capacity of 2,500m<sup>3</sup>/day for urban areas of grade IV and higher.
2. Collection, transportation and treatment of municipal solid waste
3. Treatment of hazardous wastes and co-treatment of hazardous wastes.
4. Treatment and renovation of polluted sites in public areas.
5. Rescuing and handling of oil spills, chemical incidents and other environmental incidents.
6. Construction of infrastructure for environmental protection in craft villages and industrial zones.
7. Relocation and transformation of operations of facilities that caused serious environmental pollution.
8. Environmental monitoring.
9. Cremation and electric cremation services.
10. Assessment of environmental damage; environmental health assessment; environmental assessment for goods, machinery, equipment and technology.
11. Environmental protection inventions protected by the State in the form of granting patents.
12. Production of environment-friendly products with Vietnam Ecolabel by the Ministry of Natural Resources and Environment; products from recycling and waste treatment activities that are certified by competent state agencies.
13. Production of certified gasoline, diesel and biofuel; biofuels; energy from using wind, sunlight, tide, geothermal and other forms of renewable energy.
14. Production and import of machinery, equipment and specialized tools for direct use in waste collection, transportation and treatment; environmental monitoring and analysis; renewable energy production; treatment of environmental pollution; responses to environmental incidents.
15. Production, business and services of environmental-friendly facilities certified by the Ministry of Natural Resources and Environment.

VEPF has now submitted the Plan to the Government to raise the chartered capital to VND 2 trillion during the period 2020-2021. Access to this fund is currently granted to eligible environmental activities, established under the Annex III of Decree No. 19/2015/ND-CP dated 14/02/2015, amended at Decree No. 40/2019/ND-CP guiding implementation of Vietnam Environmental Protection Law.



The restructuration of the VEPF to receive financing from other sectors under an “Extended Producer Responsibility” scheme is already under discussion at the highest level, with the revision of the Chapter X of the Law of Environmental Protection, which is currently undergoing and will be approved in the next few months.

The draft of the LEP currently under discussion includes the provisions that industries importing or manufacturing products containing hazardous chemicals, difficult to be recycled, generating large amount of waste (like single use plastic products) will either implement EPR activities or directly contribute to the VEPF fund with compensation fees related to specific waste management and recycling issue. This could largely increase the size of VEPF fund which will then act as an intermediate financial facility to implement aspects related to the sound disposal of hazardous waste / chemicals and circular economy.

UNDP is currently implementing a global project on green “health” procurement, (Strengthening Sustainability in the Health Sector in Developing Countries) with a component in Viet Nam, where the project is implemented by the Planning and Finance department and the Centralized Procurement Centre of MOH, who is mandated to procure all medicines/health equipment under the Target Programme. The project, funded by the Swedish International Development Agency (Sida), is jointly designed and implemented (2018-2021) by UNDP and Health Care without Harm.

### **C) The proposed alternative scenario with a brief description of expected outcomes and components of the project.**

The project intends to address the intentional or secondary contamination of POPs (PBDEs, PFOS, PFOA, HBCD, SCCP) in plastic, foam, paint, chrome plating, incineration, iron and steel and other related sectors, with the general objective to protect human health and the environment. More specifically, through training, technical assistance, awareness raising, and the implementation of a high-leverage financing mechanism, the project intends to:

- Promote sustainable production and consumption through application of Green Finance Framework and the use of Ecolabeling on products.
- Implement EPR schemes and Ecolabeling programs aimed at ensuring that the environmental costs associated to the manufacturing of plastic, polymers and other goods are fully internalized, with specific reference to the use and release of POPs and other chemical of concerns, and waste management.
- Promote environmentally friendly design where the technical properties of POPs or other chemical of concerns are not anymore needed as they are replaced by intrinsic properties of the products or the materials;
- Speed-up the phasing out of specific mercury-containing products,
- Support industrial initiatives aimed at the production of POPs and mercury free products with a circular economy approach taking care of the consumption of chemicals and resources throughout the full production chain;
- Support the installation of modern Air Pollution Control Systems (APCSs) for the reduction of mercury and U-POPs emissions.

The project intends to address the existing barriers and to integrate the existing baseline projects through implementation of an alternative scenario which is summarized below.

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. Nevertheless, extreme weather conditions are more frequent in the last year and may potentially affect any place in Vietnam, 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.

Figure 1: Theory of Change

Issues	Baseline (gaps)	Baseline projects	Barriers	Solutions / outcomes	Targets
Regulation on POPs: incomplete /not properly enforced	Existing regulation on POPs still incomplete and not properly enforced.	The process of POP inclusion in LEP already started. EPR regulation exists though not properly enforced. PRTR regulation being piloted.	Limited communication between technical experts and regulators. Limited resource to enforce regulations. Insufficient monitoring	Support on the revision of the LEP and on VEPF. Regulation on Green Labeling schemes developed. (outcome 1.1) An EPR scheme EPR integrated with green labelling scheme will be developed and enforced (outcome 1.1). Regulation on Mercury developed: mercury in products and industrial emissions of mercury (outcome 1.2).	Regulation updated and made compliant with POP and Hg provisions
Regulation on Mercury incomplete / not properly enforced	Implementation circular are missing for some sectors..				
POPs still used in industries in Vietnam	Based on NIP, and additional info, new POPs are being used in industrial processes like building, steel plating, plastic, paint manufacturing.	The Green Chemistry project is currently demonstrating alternatives to POPs in chrome plating and paint manufacturing.	Lacking of knowledge on alternative processes and materials. Investment costs. Lack of knowledge and practice on non-chemical alternative to POPs. POPs free articles/processes currently not covered by the Green Financing Fund.	The existing VEPF fund upgraded to include POPs and mercury and APCs (outcome 1.3). Technical support / training on chemical and non-chemical alternative product design ) in key sectors. (Outcome 2.1) Raising awareness on green financing instruments. Assistance in the development of eligible proposals to be funded with VEPF loan. (Outcome 1.3)	A sustainable financing mechanism to prevent POPs and mercury use and release established
POPs in end of life products and waste	Based on NIP, several POPs may be present in in use or end of life products. No segregation of POPs contaminated waste. Limits for the presence of POPs in products or waste are in most cases missing. .	Technologies for the disposal of POPs waste exists in Vietnam. A Green Financing Fund is established	The lacking of criteria and limits for POPs in raw materials and recyclable waste, like plastic, building waste, ELV, WEEE, foam, fibers, etc. hinders the development of circular economy. A large amount of waste is processed informally	Surveys in manufacturing sectors, quality standards for the presence of SCCP, PBDEs, PFOS, PFOAs in products will be developed and proposed. The current green labelling scheme updated to include POPs (Outcome 2.1) Interaction, technical exchange and commercial agreement between recyclers and industry promoted (outcome 2.2)	POPs prevented or disposed for an overall amount of 35 tons (500 tons of materials containing POPs
U-POPs released from processes	U-POPs and mercury emission from incineration, steel factories identified at NIP. Industries not equipped with effective APCs	Under the POPs management project, a PRTR database of industrial emission is being piloted. U-POPs and mercury emissions from industrial facilities measured,	Industries unlikely to upgrade their APCs in the absence of a more stringent regulation due to the investment cost and the technical complexity.	Design and implementation of modern Air Pollution Control Systems to prevent the release of mercury and U-POPs also for small enterprises carried out. Firms will be assisted to design APCs for submission under the Green Financing. (Output 2.1.3)	U-POPs and mercury emission reduced (up to 648 kg of Hg and 2 gTEQ OCDD/F
Mercury released from processes					

**Component 1: Promote sustainable production - consumption in key sectors through Ecolabeling, Green Financing and Procurement, and other elements to support a long-term Innovation Ecosystem for greening the value and supply chain across sectors.**

Aiming to create a legal framework and practice on incentive mechanism, this component will review several related documents such as Article 44 Law on Environment Protection “Environmentally friendly production and consumption”; Circular 41/2013/TT-BTNMT stipulating procedures for certifying environmentally friendly products and related MONRE Decision to implement Circular 41/2013/TT-BTNMT. Especially, Decision 154/QĐ-BTNMT dated 25 January 2014 introduces list of criteria for 14 types of industry, which need to be updated and upgraded to include POP and mercury into account.

The projects intend also to support VEPF on the revision of the “List of environmental protection activities eligible for preferential support” under Annex III of decree No. 19/2015/ND-CP dated 14/02/2015, with the intent to identify criteria for supporting POPs and mercury free production processes and products, and to enhance the support for the establishment of air pollution control systems. Ecolabeling criteria for alternatives to mercury products (lights, thermometers, sphygmomanometers) and POPs free alternative products from plastic paint, polymers and other sectors will be developed and proposed for inclusion under the list of eligible projects to be funded with the Green Financing Framework. Therefore, activities in the Component will provide support to MONRE and MOIT in meeting the needs in their Plans and operational documents to properly cover the release reduction and phasing out of mercury and POPs in processes, products and recycled materials. This component will be based on the following outcomes and outputs:

**1.1 Environmental regulation upgraded to include new POPs; Green label and related policies for selected sectors (e.g. plastic, polymers, others) developed and implemented to reduce POP direct and secondary use, to reduce U-POP releases and to enhance circular economy.**

Under this outcome, the country regulation relevant to new POPs will be updated, covering such aspects restriction of the use and import of POP chemicals not yet regulated (like PFOS and SCCP), quality standards in terms of concentration limits for additives and harmful chemicals, Ecolabeling certification systems for manufacturers and recyclers. Quality standards including concentration of POPs brominated flame retardants and plasticizers, POPs precursors and other substances of concern in products and processes will be developed.

**1.1.1 Review, amendment of existing, or creation of new legislation related to POPs and new POPs in key sectors (e.g. plastic and polymers, metal plating, paint/solvents, etc), including ensuring inclusion of provisions to support, inter alia, prohibition of import for new POPs; concentration limits for POP brominated flame retardants, HBCD, SCCP and other POPs/PTS in products and waste; development of Ecolabeling schemes; new EPR schemes developed and enforcement of existing EPR schemes improved.**

In coordination with MOIT and MOH, under this output the existing legislation related to the intentional or unintentional use (for instance through the use of contaminated recycled materials) of POPs chemicals manufacturing processes (plastic, polymers, hard-plating, paint) will be assessed. The potential human exposure during the use of specific

articles will be examined when assessing the current technical legislation. When necessary, specific restrictions will be proposed for the presence of specific chemicals in articles, like PBDEs, SCCP, HBCD and PFOAs, considering also that restrictions to the use of PBDEs and PFOS are already established under the REACH regulation and the ROHS directive in Europe, potentially affecting Vietnamese exporters of plastic and polymers articles.

Voluntary or mandatory quality standard for the concentration of BFR and other POPs in plastic and polymer materials and products do exist worldwide.

In Vietnam the informal recycling chain (mostly based on craft villages) does not follow any of these standards, whilst larger manufacturers products are required to fulfil the international standards of the countries of export and are usually not willing to use recycled material generated locally. Under this output, quality standards for the presence of SCCP, PBDEs, HBCD, PFOS, PFOAs in products will be developed and proposed. The current Ecolabelling mechanism in place in Vietnam will be updated to include thresholds for POPs in the certification schemes, in line with existing international Ecolabelling schemes (like Oeko-tex 100).

The development of a Ecolabeling scheme may include the development of the logo, the listing of the criteria and quality requirements, identification of certified laboratories which can undertake the certification of compliance, and the identification of products/manufacturers which can be interested in such certification. A budget plan for the implementation of the green-labelling scheme will also be developed.

EPR is defined as “an environmental policy approach in which a producer’s responsibility for a product is extended to the post-consumption stage of a product’s life cycle. “. In some industrial sectors – for instance the manufacturing of tires in the EU- the Extender Producer Responsibility already requires that for each amount of product being manufactured, the same amount will be reused or recycled, with specific targets for the modality of recycling. This is not the case of plastic products in Vietnam, where the cost for recycling or disposal are fully externalized. A soundly implemented EPR schemes would ensure not only that the environmental impact of the manufacturing of plastic and polymer products is fully internalized, but would also ensure that the material contaminated by POPs and other unwanted chemicals is identified, kept separated from the non-contaminated material and treated in the proper way. To this purpose, the EPR scheme can be integrated with Ecolabelling scheme and tentatively articulated in such a way that for a list of products to be identified, for each ton of product, the minimisation, recycling or disposal of an equivalent amount of the same type undergoing one of the following routes will be ensured at the cost and responsibility of by the manufacturers:

- Use reduction or re-use
- Reuse in similar articles (horizontal recycling)
- Reuse in lower technology articles (downcycling)
- Recycling as material and
- Energy recovery
- Incineration in SC compliant HTI destruction plant

Under this output, in addition of the development of new EPR schemes for specific product categories (for instance, plastic packaging), a better enforcement of the Decision N°16/2015 regulates the collection after use of products like vehicles, tires, electronic devices, oil, and batteries will be also supported. A public/private agency in charge of certification of the achievement of EPR targets and networking among manufacturers and recyclers and collection service provider will be piloted.

## **1.2 Environmental policy on mercury developed and implemented to replace mercury products and to enhance the management of products containing mercury at their End of Life with segregation of mercury and recycling of non-mercury components.**

This outcome intends to remove the barriers currently hindering the phasing out of certain mercury products, and to enhance the legislation dealing with mercury in products, in waste, and release of mercury from industrial sources. It is based on analysis and upgrade of existing legislation, development of a roadmap for the phasing out of mercury in products, and development of regulation concerning the modality for mercury waste handling and disposal.

### **1.2.1 Roadmap and sectorial plans developed for replacement of mercury thermometers and mercury containing lamps established.**

The Minamata Convention calls for banning the import, export and manufacture of mercury-containing lamps by 2020. In Vietnam, manufacturing and import of fluorescent lamps is already decreasing, however it is likely that the manufacturing will be not completely phased out by 2020. A road map toward the complete phase out of fluorescent lamp import and manufacture will be drafted. This will include the following aspects:

- Deadlines for the progressive phasing out of the manufacturing of fluorescent lamps;
- Obligations for the manufacturer to verify the presence of mercury in their facility, in terms of contamination and presence of stockpiles of unused mercury or mercury amalgams;
- Investment plans, (to be co-financed by manufacturers), for the necessary clean-up of mercury contaminated area and disposal of mercury stockpiles;
- Investment plan (to be co-financed by government and manufacturers under an EPR scheme) for the deployment of technologies for collection and recycling of fluorescent lamp, with safe segregation and storage of mercury.

From 2020, the Convention will also ban the production, import and export of blood pressure monitors and clinical thermometers. Although in many hospitals these devices have been already replaced, the use of mercury thermometers is still extremely widespread in Vietnam. The roadmap for the phase out of mercury devices will include:

- Plan for nationwide awareness raising for hospital managers, representatives of pharmacies, clinics and veterinary clinics on the use of non-mercury clinical devices, the risk posed by mercury, emergency response (spill kits) and disposal.

- Inventory of Vietnamese factories still manufacturing mercury thermometers;
- Deadlines for the progressive phasing out of the mercury thermometers (manufacture, import and use)
- Monitoring plan to verify mercury contamination and presence of stockpile of phased out mercury devices in hospitals, and investment plans, (to be co-financed by government), for the necessary clean-up of mercury contaminated areas and disposal of mercury stockpiles;
- Investment plan (to be co-financed by government via VEPF) for the deployment of technologies for collection and recycling of mercury containing devices, with safe segregation and storage of mercury.

**1.2.2 Review of the existing legislation related to mercury in products and mercury emission carried out, to help develop and/or strengthen, and ultimately enforce regulations concerning technical standards for mercury waste management.**

Currently, emission limits for mercury emission have been established for industrial and medical waste incinerators (QCVN 30:2012/BTNMT, QCVN 02:2012/BTNMT) and cement kilns burning waste (QCVN 41:2011/BTNMT); no limits is established for other industrial sources like power plants or steel industries. Mercury concentration limits have been established for food items (QCVN 8-2:2011/BYT) and drinking water (QCVN 01:2009/BYT). Concerning articles, the maximum allowable concentration of mercury in fluorescent lamps is set by regulation the Circular No. 30/2011/TT-BCT dated August 10, subsequently amended by the Decision No. 4693/QD-BCT dated September 16, 2011 of the Minister of Industry and Trade. There is no regulation yet which establish the phasing out of fluorescent lamps in line with the Minamata convention. Under the project, emission limits for the mercury emission from key industrial sources like cement kilns, municipal waste incinerators, power plants, non-ferrous metal, iron and steel works will be reassessed, developed and proposed. Draft regulation for the complete phasing out of mercury thermometers and sphygmomanometers will be also developed and proposed.

The existing regulation on waste will be amended to include the following:

- 1) classification of mercury containing waste;
- 2) accepted collection and recycling methods for mercury containing waste, with safe segregation of mercury during collection / recycling operation;
- 3) accepted disposal and long term storage methods for mercury stockpiles;
- 4) licensing aspect for waste disposal service providers.

**1.3. Development of a Green Finance Framework, to sustain the shifting of enterprises toward a non-POPs and a non-Mercury manufacturing.**

1.3.1 Green Finance framework designed, funded and implemented to support private sector on getting incentives policy (e.g. tax, fee, credit fund, investment equity). Ecolabel improved, funded and properly communicated, building on national and other finance institutions (e.g. the Viet Nam Environment Protection Fund (VEPF))

A Green Finance Framework will be developed with the purpose to:

- Support the quality-controlled conversion of production lines, toward less-chemically intensive products and materials, replacement of POPs with non-POPs / non-hazardous chemicals, management of obsolete POPS and mercury stocks;
- Support the private sector to get incentives policy (eg tax, fee, credit fund, investment equity) in production of eco-friendly products carrying Ecolabel

Under this output, the project will therefore identify and implement green finance instruments aimed at:

- i. Speeding up the process of replacing mercury products (thermometers, lights) with non-mercury products;
- ii. Implementing EPR schemes to ensure that mercury containing products at their end of life stage are properly processed and disposed of;
- iii. Supporting industries on the investments related to the design and instalment of air pollution control systems, aimed at reducing emission of mercury and U-POPs (as very often these technologies can reduce both);
- iv. 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.

To this end, enterprises will be assisted in identifying and submitting applications to access finance from green financing schemes, particularly these provided by governmental entities, like the Vietnam Environmental Protection Fund, the National Technology Innovation Fund (when a new charter will be approved), the Vietnam Development Bank, and by bilateral entities like international development banks and foreign donors. More specifically, applicants will be guided on how overall Ecolabeling/EPR scheme and related policies will have the access to finance mechanism.

The project will also assist VEPF 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 and mercury stocks. A grant financial support with a high leverage factor (1/10) will be provided to support projects in the field listed above. In practical term, the Green-Finance framework to be developed under the project will work in this way:

- One or more Green-Financing entities will be identified (VEPF has already committed to work as a Green Financing entity for the project);
- The existing rules or list of eligible project under the Green-Financing entity will be updated to include new eligible projects identified by the project;
- The project will assist enterprises to submit their projects to the Green-Financing entity, and will provide the Co-financing entity with a small grant intended to cover part of the operational expenses;



- The Co-financing entity will fund the project at an agree interest rate applied only to projects identified under the project, for an overall budget of USD 5,000,000, and with an interest rate of 2.5% over max. 10 years.

In this way, considering that the commercial interest rate in Vietnam is around 6.5%, and that the Green Financing Entity (VEPF or others) will provide loan at around 2.5% interest rate for an overall amount of 5,000,000 USD, the direct co-financing from VEPF over a total loan of 5,000,000 disbursed over 10 year may be calculated as  $((6.5\% - 2.5\%) \times 10) \times 5,000,000 = 2,000,000$  USD; the cash co-financing from the enterprises subscribing the loan would be 5,000,000 USD plus 14,000,000 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 19,000,000 USD cash against a GEF financing of 1,500,000 USD, and will be entirely accountable and traceable.

This mechanism is further explained in the table below:

Green Loan fund size (USD) subscribed by enterprises	\$5,000,000.00
Commercial interest rate %	6.50
Green Fund interest rate %	2.50
Differential interest rate (supported by VEPF)	4.00
Loan duration (years)	10.00
VEPF co-financing through interest rate support (USD)	\$ 2,000,000.00
Industries direct investment (USD)	\$14,000,000.00
GEF Grant (USD)	\$1,500,000.00

The VEPF (Vietnam Environmental Protection Fund) is a branch of the Ministry of Natural Resource and Environment), established in 2002 together with the establishment of MONRE. As such, it's a permanent institution with the main role to facilitate investment in the environmental field, through technical assistance and competitive loans on eligible environmental projects. Over 17 years, the Fund has granted 275 loans with total capital of 120 million USD. VEPF represents the commitment of MONRE to support the natural resources conservation and environmental protection. VEPF also receive insurance deposit from projects that poses risk to the environment as well as project on exploitation of natural resources. Therefore, financial resources of the fund are sustainable. It should also be considered that the interest rate is very competitive in the Vietnamese market, but still sustainable from the financial standpoints it can ensure a good interest rate in the international market. Therefore, any new sector or activity established as VEPF eligible

under the project will continue to be supported after the end of the project. According to current regulation, charter capital of the VEPF is 50 million USD, and MONRE is submitting the proposal to the Prime Minister to raise the charter capital to 150 million USD in the period 2019-2020.

In addition, also other financial institutions will be identified during PPG phase.

#### 1.3.2 Green Procurement scheme designed and implemented for MONRE, some DONREs and healthcare facilities (MOH).

Under this output, the following will be achieved:

- A procurement subsidization scheme will be created to support green procurement, application of mercury-free lighting, electronics, medical thermometers and sphygmomanometers, sound management of obsolete mercury containing devices, any related capacity building and awareness activities in medical facilities;
- Rules for green-procurement to be applied by MONRE and DONRE and healthcare facilities (MOH) will be established, to ensure that only POPs and mercury free products and sustainable products are procured. This could be in connection with the Green Financing Framework to ensure a first channel of market access to enterprises who decided to operate under the specific sustainability rules required for GFF.
- The green procurement scheme for healthcare facilities will be developed in coordination with the one already piloted under the GEF-funded UNDP-Health Care Without Harm (HCWH) project “Strengthening Sustainability in the Health Sector in Developing Countries”

### **Component 2: Lifecycle management of POP s and PTS containing products.**

Under this component, a better management of specific products components and materials throughout all the stages of their lifecycle will be planned and demonstrated, with the purpose to reduce the amount of POPs and other chemical of concern in materials and article in use, ensure that recycled materials (plastic, fibers) are POPs free, improve and promote horizontal recycling to prevent contamination of end of life material, segregate and safely dispose POPs contaminated waste.

#### **2.1 Sustainable manufacture and design of plastic, polymers, paint, metal finishing and other products improved to prevent the use of POP and the release of POP in the environment.**

2.1.1. Analysis of the manufacturing sectors for which the use of new POPs has been recently confirmed but not yet included in the NIP carried out, in order to strengthen baseline and select optimum sectors and enterprises for pilot activity to improve POPs management in the value chain.

In coordination with the relevant industrial sector associations (plastic, polymer, paint, metal plating, etc.) and with the support of MOIT and MONRE, a survey will be carried out along the full value chain manufacturing sectors, to identify processes and materials which may be affected by the presence or release of POPs and other substance of concern, with specific focus on PBDEs, PFOS, PFOAs, HCBd, SCCP. The purpose of this survey is to achieve consensus on the list of POPs and other substances of concern that may

present particular risk for the environment and the human health, and reach an agreement on initiatives and certification schemes aimed at reducing these substances in all the step of manufacturing process. This activity will also build-up on the results achieved in the course of implementation of the “Green Chemistry project”, with the more specific objective to develop list of restricted substances, either in the processes or the final products, to be implemented through voluntary mechanisms (Ecolabeling) or as part of an amended regulation. As previous experiences demonstrated that questionnaire tools are not the most effective methods for carrying out these surveys, the follow top-down approach will be adopted for data and information gathering:

- Top-down design of the survey. The survey target will be initially designed with the assistance of industrial associations, MOIT and MONRE. Sharing of information related to the processes and size of the industries, consumption of resources, condition of the surrounding environment will be achieved at this stage.
- Interviews and site-visits with manufacturers operating in the international market. International suppliers already adhering to voluntary green-labeling or certification schemes will be contacted. Interviews with suppliers exporting to Japan, USA or Europe will be carried out with the purpose to understand the mechanisms for compliance and verification in all the manufacturing stage, and the list of restricted substances or chemical products included in the certification scheme.
- Interviews and site visits to SMEs and manufacturers operating at national level (not operating directly at international level) to verify the substances used in their manufacturing processes along the value chain, and to assess the mass balance of chemicals.

The basic objective of the survey will be to identify key products and sections of the value chain where the limitation on the use of POPs and other substance of concern may be more effective. For instance, identification of plastic components in products which are still treated with flame retardants due to their function (electric cables or component near to a heat sources); industrial processes that can be optimized through a more efficient use of chemicals, recycling of unused chemical streams, recovery of water sources, etc; or bad substitutes of POPs (replacement of POPs substance with others with very similar properties, like deca-BDE with Decabromodiphenyl ethane (DBDPE), or other POPs with substances already proposed for listing under the Stockholm Convention.

#### 2.1.2 Alternative product design to prevent the use of hazardous chemicals additives in general and consequently the use of POPs (e.g. BFR, HBCD, PFOS/PFOAs, SCCP) in key sectors demonstrated.

To obtain the desired fire-retardant behaviour in products, the use of hazardous chemicals can be prevented through chemical replacement (POPs with non-POPs, or hazardous with non-hazardous chemicals), through material replacement (flammable materials with non-flammable materials, i.e. organic fibers instead of poly-urethane foam), function re-design (thermal efficiency with less heat release instead of protection from, etc).

Similarly, non-hazardous nanoscale materials, C4 back-bone molecules instead of C8, fluorine free substances are now available options to prevent the use of traditional water-repellent chemicals like PFOS, PFAs or PFOAs. The complete replacement of PFOS or PFOAs is however difficult as no substance reach their water repellence effectiveness.

In the case of chrome plating, the replacement of PFOS as mist suppressant has been extensively studied and is now technically possible except for few cases where the specific requirements of the products still require the hard-chrome plating process; however, in most of the cases, the hard-chrome plating has been successfully replaced by other safer processes like zinc-flake plating or zinc-alloy plating with CrIII passivation which do not require the use of PFOS.

Under this output, the project will establish a network of knowledge in Vietnam to actively identify solutions aimed at:

- Identify non-POPs processes or non-chemical alternatives which do not require the use of hazardous additives due to the intrinsic characteristic of the process;
- Using less flammable materials that do not need to be mixed or wrapped with flame retardants. Examples: mattresses made with organic cotton fabric and cotton batting instead of memory foam or PUF, which are intrinsically compliant with safety standard;
- Replacing POPs substance or POPs precursors with harmless substances in the specific field of flame-retardant and water repellence;
- Reduce the amount of flame-retardants or water repellence chemicals through optimisation of the coating and mixing processes so that the required standards are achieved with reduced use of substance;
- Identify win-win design or engineering solutions aimed at reducing the need for water repellence or heat resistance, by displacement of components in the product, better heat dispersion, better energy efficiency, micro- and nano-scale design of materials, etc.: for instance, the use of LED instead of fluorescent lamps or incandescent lamps generate less heat and requires less flame retardant protection, etc.

A specific category of “Ecolabeled products” will be identified so the design, manufacturing and placing on the market of products fulfilling the above requirements will be eligible under the green-financing mechanism developed with VEPF (see output 1.2.3).

#### 2.1.3 Design and implementation of modern Air Pollution Control Systems to prevent the release of mercury and U-POPs suitable also for small enterprises carried out.

The project will support industries willing to upgrade their Air Pollution Control Systems (APCSs) in:

1. Designing better APCS aimed at the reduction of the release of particulate matter, U-POPs and mercury;
2. Preparation of the dossier for the submission of the projects under the Green Financing Framework;
3. Undertaking sampling and analysis of the concentration of U-POPs and mercury in flue gas before and after the implementation of the upgraded APCSs. The APCSs will be considered as eligible for the Green Financing Mechanism developed under Outcome 1.2, Output 1.3.1.

Under this output, it is planned to achieve a reduction of emission of mercury and U-POPs in the environment through the establishment of APCS capable to reduce the concentration of mercury from an average 100µg/Nm<sup>3</sup> for mercury and 6.93 ngTeq/Nm<sup>3</sup> for PCDD/F (based on the average analytical result for incinerators based on the surveys carried out under the Viet Nam POPS and Sound Harmful Chemicals Management Project) to 10µg/Nm<sup>3</sup> for mercury and 0.1 ngTeq/Nm<sup>3</sup> for PCDD/F for a number of plant representing a flue gas flow rate of up-to 1,000,000 Nm<sup>3</sup>/hr . This correspond to an amount of 648 kg of mercury/year and 2 gTeq/year for PCDD/F.

## **2.2 Closure of the gap between recyclers and industry to sustain circular economy and to prevent the contamination of recyclable materials.**

2.2.1 Interaction, technical exchange and commercial agreement between recyclers and industry promoted to identify and implement solutions for the horizontal and safe recycling and of materials and the segregation and safe disposal of POPs contaminated materials.

In Vietnam, recyclable waste is still largely recycled in small recycling village, dumped in landfills or abandoned. Therefore, despite the abundance of some recyclable materials, manufacturers prefer to base their production on virgin materials because the quality of the recycled materials does not fulfill their technical standards. The difficulty lies also in the fact that manufacturers mostly operate as registered companies, whilst recycling of waste occurs mostly informally, through informal collectors and recycler. Therefore, the gap in communication between manufacturer and recyclers occur at two level: technical and organisational.

Under this output, opportunities for recyclers and manufacturers to exchange their needs and constraints will be therefore created. That will ensure, from one side, that recycler can access an higher quality market, by taking part in take-back or collection schemes aimed at ensure that the quality of the recycled material fulfill the needs of the industry; and manufacturers could have access to recyclable resources to replace virgin materials.

In terms of POPs prevention, promoting up-cycling or horizontal recycling has the benefit of reducing the cross-contamination of recycled material – plastic treated with flame retardant will be use for the same purpose without the need to add additional flame retardants in the mixture, or without contaminating plastic products which instead do not need to be treated with flame retardants.

Up-cycling or horizontal recycling may be also achieved through the establishment of take-back schemes for specific products: typical example in Vietnam is the case of the 19 liters water bottle which remain property of the water distributors, and which are therefore constantly re-used as such, and only at the end of their life-cycle after many reuse, recycled to produce other plastic bottles.

This service model could be replicated to other consumer products delivered in plastic containers (for instance detergents), however, take-back schemes will also be explored for a number of other articles (with the purpose to re-use or recycle plastic) with the aim to keep the material in the same circuit loop: for instance, plastic car components which may be treated with BFR should be kept in a separate loop and recycled with the same category of components. Take-back schemes would require cooperation among different manufacturing industries and should be integrated as part of their EPR obligation as described in output 2.1.3. The advantage of take back scheme are multiple: they increase the life of specific products; keep separate good quality material (non-contaminated plastic for instance) from contaminated materials; ensure that end of life material is not abandoned or improperly disposed of, with potential release of U-POPs.

Under this output, therefore, the following will be achieved:

- Ensuring effective technical exchange between recyclers and manufacturers, through the establishment of dedicated workshops where industry meet recyclers.

- Identification of the disposal options for the non-recyclable fraction of waste, including the definition of commercial agreements between industries and recyclers (i.e. cement factories) which can benefit from the calorific values of specific waste stream and ensure that POPs contaminated fractions of specific waste stream (for instance, plastic, polymer, building waste, paper) are disposed of in compliance with the BAT/BEP of the Stockholm Convention.
- Demonstration of material up-cycling through collection and reuse of excess material released by manufacturing enterprises, before this material enters the waste cycle. This will be ensured through a proper mapping of manufacturers of specific products (packaging, polymers, etc.) and their association into a network of up-cyclers, possibly through the development of a platform of excess materials.
- As a second, more ambitious goal, a take back scheme will be designed and piloted for a specific product or product components (including plastic or polymers treated with flame retardants) which will entail:
  - 1) characterisation of the composition of the article of article component to be recycled;
  - 2) dismantling instruction;
  - 3) traceability of the product from the manufacturing to the consumer;
  - 4) incentivized collection of the article/product at their end of life, by the manufacturer or an authorised recycler;
  - 5) dismantling on the basis of the dismantling instruction and re-introduction of the recyclable material with horizontal recycling or up-cycling.

### **Component 3: Mercury: lifecycle management of mercury containing products**

#### **3.1 Replacement of mercury products with non-mercury products promoted and sustained by EPR schemes and EOL management.**

In Vietnam, most of mercury containing products are already being replaced by non-mercury products: LED lights are replacing fluorescent lamps, composite amalgams are replacing mercury amalgams, and electronic devices are replacing mercury thermometers. There are however still a significant amount of mercury containing products in use, and their replacement imply not only the finding of suitable alternatives (which are all available) but a sound and progressive phase-out plan accompanied by a proper waste management plan. For mercury thermometers, the replacement occurs too slowly; for mercury lamps, the replacement is getting massive as very soon fluorescent lamps will be out of market, and a proper waste management plan is extremely urgent; in the case of mercury amalgam, the issue is most on the side of management of mercury waste from dental clinics. Under this component replacement of mercury products with non-mercury products will be speeded up and technology for the safe disposal and storage of mercury waste demonstrated.

3.1.1 Risk management, technical guidance and training materials developed for the sound management of mercury stockpiles and obsolete mercury-containing equipment, with specific reference to mercury lamps and medical devices.

Replacement of mercury products will be enhanced by proper awareness raising campaigns, aimed at illustrating the risk associated with mercury exposure, the benefits characteristics of mercury alternatives, and the needs for proper management of mercury waste with segregation of mercury.

Under this output, the project will coordinate with the UNDP / GEF5 project “Local Development and promotion of LED technologies for advanced general lighting” by providing collection and storage infrastructures for phased out fluorescent lamps. The project will also support the collection and safe storage of any mercury and mercury amalgam stockpile left in fluorescent lamp manufacturing plants due to the reduced or interrupted manufacturing of fluorescent lamps. To do that, proper discussion with fluorescent lamp industry representatives will start in due time at PPG stage.

#### 3.1.2 Capacity and institutions are strengthened to eliminate use of mercury containing products (e.g. Mercury lamps, thermometers and cosmetics); road map and plan for using of mercury-free devices developed and implemented.

Although the replacement of mercury with non-mercury thermometers already started years ago in in Vietnam, (UNDP project on Global Healthcare Waste), there are still many hospital and clinics which are using almost exclusively mercury thermometers. Mercury thermometers are also still commonly sold in pharmacies. In compliance with the WHO guideline on the replacement of mercury containing devices[1], the project will promote the replacement of mercury thermometers with non-mercury thermometers, through awareness raising campaigns specific for hospitals and small clinics, mostly aimed at explaining the reliability of non-mercury thermometers, the procedures for using and calibrating non-mercury thermometers, as well as the modalities to dispose mercury thermometers and the use of mercury spill kits, following the guidelines jointly developed by UNDP and WHO in other projects.

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[1] WHO, 2015: Developing national strategies for phasing out mercury-containing thermometers and sphygmomanometers in health care, including in the context of the Minamata Convention on Mercury: key considerations and step-by-step guidance. [https://www.who.int/ipcs/assessment/public\\_health/WHOGuidanceReportonMercury2015.pdf](https://www.who.int/ipcs/assessment/public_health/WHOGuidanceReportonMercury2015.pdf)

The project will therefore support the following: identification of hospitals or other healthcare facilities in need of support for the phasing out of mercury thermometers, awareness raising on the risk associated with mercury thermometers and the benefit of using non-mercury thermometers; training of trainers events for the use of different category of mercury thermometers and spill kits, and for the safe collection and disposal of mercury containing waste, covering at least 50 hospital facilities across Vietnam; replacement of at least 20,000 mercury thermometers with non-mercury thermometers, and other products (e.g. cosmetics) and safe storage and disposal of the phased out mercury thermometers. The project will strictly coordinate with the UNDP-HCWH on-going project “Strengthening Sustainability in the Health Sector in Developing Countries”.

#### 3.1.3 Technologies for the recycling of mercury containing equipment with segregation and storage of mercury established

Under this output, procedures and technologies for the proper recycling of mercury containing equipment will be demonstrated. These will include vacuum shredders for the segregation of mercury along with the recycling of glass and metals; safe storage for mercury waste before treatment, and for segregated waste (including mercury) after treatment. Initially, a pilot facility for treatment of mercury waste will be established at one of the URENCO waste treatment facility. The entire procedure (removal of mercury containing products, packaging, transportation, temporary storage, treatment with mercury segregation, and final disposal / recycling of the recyclable materials will be demonstrated.

#### **Component 4. Monitoring, learning, adaptive feedback, outreach and evaluation.**

The project will be monitored and evaluated following UNDP and GEF standard procedures for project monitoring and evaluation. The monitoring will include the development of the GEF Tracking Tools at different stages of project implementation; the analysis of project achievements against the objectively verifiable indicators; the preparation of Project Implementation Reports (PIR), Project Annual Workplans, Project reports and technical reports. The evaluation will consist in 2 independent evaluation (mid-term and terminal) carried out by a team of independent evaluators (one international and one national). A project audit will be carried out annually. A project knowledge management system, where all the project documentation will be stored, will be implemented in a website with personalized access levels for the project partners.

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

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 or mercury. The project will address chemical waste at the end of life, chemicals that are used or emitted from processes or products, and waste management.

More specifically, the project envisages:

- The Environmentally sound waste management/disposal of mercury/mercury containing waste (Project component 3)
- The prevention of waste/products containing persistent organic pollutants from entering material recovery supply chains (project component 2)
- Elimination of the use of mercury 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 (project components 2 and 3)
- 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 both the Stockholm and Minamata Conventions 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 Minamata and Stockholm convention obligations, with regard to persistent organic pollutants and mercury (project component 1)
- The project will also support sustainable material management initiatives, including circular economy, sound material-cycle society, and sustainable materials management approaches, promoting the adoption of improved production, consumption and environmentally sound disposal patterns (project component 2 and 3).
- In doing so, when feasible, the project will establish and promote public-private partnership on all the sides of waste collection and minimization, waste recycling, manufacturing, and will promote the adoption of voluntary certification in both the recycling and manufacturing sides (project component 1, 2 and 3).

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

The Vietnam government has put in place a number of initiatives aimed at effectively streamlining the Stockholm and Minamata convention into the relevant regulatory instruments (the Law on Environmental Protection and the Law on Chemicals). In addition to that, Vietnam has established or is in the course of establishing the following national action plans:

- National action plan in support on sustainable production and consumption (Decision 76/QD-TTg dated 11 January 2016).
- National Action Plan on Marine Plastic Debris Management until 2030 (currently under development with technical support from UNDP).
- National Action plan on Air Quality Management until 2020

In 2018, Vietnam also conducted a voluntary national review on the implementation of the sustainable development goals by 2030, by translating the seventeen global SDG into 115 Viet Nam SDG.

GOV has also put in place a number of initiatives to financially support – through grants or competitive loans – industrial projects resulting in reduced impact to the environment or placing on the market of green-labelled products.

Increasing attention is paid by the government also in ensuring that products are safer for the consumers. For instance, MOIT recently released Circular 21/2017/TT-BCT, which promulgated QCVN 01:2017/BCT on contents of formaldehyde and certain aromatic amines derived from azo colourants in textile products (effective from January 1, 2019).

The establishment of the Vietnam / EU free trade agreement with Vietnam will have as a consequence that industries will have to fully comply with all the EU quality requirements related to the presence of chemicals in their products or articles, including POPs and other chemicals of concern. In Vietnam, the lighting manufacturing industry already shifted from the production of fluorescent (mercury-containing) lamps toward mercury free LED. The private sector is also paying more attention toward the development

of initiatives aimed at sustaining circular economy, reduced use of hazardous chemicals in production, collection and recycling of waste, etc. although most of their initiatives in this area are still at the pilot stage and the time limit set for their full implementation is far[1]<sup>2</sup>.

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[1] Representative of Coca Cola Viet Nam affirming that ““by 2030, Coca Cola will collect and recycle all of the waste it produces in the form of bottles, cans, nylon, paper, and more.” <https://www.vir.com.vn/global-powerhouses-to-back-circular-economy-56374.html>

Therefore, in Vietnam there is quite a vigorous trend, both on the governmental and private side, toward a more sustainable production of goods, reduced use or phasing out of hazardous chemicals including POPs and mercury, reduced impact of industrial production on the environment. However, these efforts are still scattered, mostly limited to large enterprises aiming at exporting toward Europe or USA, largely uncoordinated, and therefore concern a minor fraction of the potential target. Support is needed even on the side of development, implementation and enforcement of national plans and circular, to ensure that these plans are specific, measurable, relevant and time-bound (SMART) as well on the side of technical assistance to industry to fully implement and monitor their environmental performance.

Therefore, through the establishment of this alternative scenario, the project intends therefor to support and integrate all these ongoing activities to ensure that they are compliant with the Stockholm and Minamata convention.

More specifically, under **Component 1** (Alternative products are incentivized through Ecolabeling programs, regulation and guidance) the project will ensure that the Policies on products which may be treated with POPs are effectively developed and implemented to reduce POP direct and secondary use (through recycling of contaminated materials), to reduce U-POP releases and to enhance circular economy, and that the policy on mercury is developed and implemented to replace mercury products and to enhance the management of waste containing mercury. This will ensure that the policies are compliant with the relevant conventions and that are effectively implemented and monitored. Through this component the project will also expand the target reached by these policies by proper dissemination of technical and financial information, and through including POPs and mercury free products among the ones that can be considered as green-label products and that can therefore be eligible for financial supports by VEPF or other financial institutions. In the absence of this component, the current trend toward the voluntary adoption of green-labeling scheme will be largely driven by market forces, not properly supported and monitored, and the replacement of mercury-devices with non-mercury devices, especially on the side of healthcare facilities, will proceed at the current pace. Co-financing sources for this component will mostly derive from the State budget related to the development of policies and regulations. At PPG stage, additional co-finance will be proactively searched from international green-labeling certification bodies (like Oeko-Tex) which are already operating in Vietnam.

The co-financing under this come will come mainly from the Ministry of Natural Resource and the Environment (MONRE) and Local governments as grant and in-kind contribution for a total amount of 4,000,000 USD.

**Component 2** of the alternative scenario intends to fill the knowledge gap concerning the substances (POPs and other chemical of concern, including POP precursors or candidate POPs) used in the manufacturing industry and to provide technical and financial support on the alternative design of greener products and articles. This component will, in other words, ensure, through the conduction of a survey and the establishment of a network of knowledge a mindset shifting through a more responsible design which will be mostly aimed at the manufacturing of article and materials which, because of their intrinsic design, will have reduced or no need of chemicals to ensure specialized functions (like flame-retardancy or water repellence). This will result in a reduced environmental impact throughout the whole life cycle of these products and materials. In the absence of this component, there will be no attempt to design innovative products requiring less specialized properties like flame-retardancy or water repellence; instead off-the-shelf conventional solutions mostly based on the use of specialized chemicals which may even possess POPs-like behaviour will continue. Identification of green-label design criteria for material and products, as well as less chemically-intensive process will also facilitate their inclusion under the list of project eligible to receive loans from VEPF. The bulk of co-financing will be from the private sector which will subscribe loans under the Green Financing Framework and directly invest to implement / develop projects related to POPs, eligible under the VEPF and compliant with project objectives. Most of this co-financing will be for investment in equipment (around 9,500,000 USD) including project design, training and initial operational cost of the green investments. 2,500,000 USD will instead come from institutions as well as from the state-budget allocated under the Sustainable Consumption and Production action plan.

**Component 3** of the project will instead aim at filling the gaps toward the reduction of mercury and U-POP release in the environment through several ways: by facilitating the replacement of mercury containing products (fluorescent lamps and thermometers) with non-mercury products, through incentive programs; by training and awareness raising for healthcare facilities to accelerate the phasing out of mercury thermometers; by providing technical assistance and financial support under a zero-interest loan, for the development of plants for the environmentally safe disposal of mercury containing devices and for the design, financial support and instalment of air pollution control equipment. It is obvious that in the absence of this component, the rate of substitution of mercury with non-mercury lamps would be mostly driven by market forces, whilst there would be no push toward the replacement of mercury thermometers in hospital and clinics; end of life mercury equipment will mostly be dismantled in municipal waste, and no technology for the segregation of mercury from end of life equipment (lamps and thermometers) will be demonstrated. Also for this component, the bulk of co-financing (9,500,000 USD) will be from the private sector which will subscribe loans under the Green Financing Framework or directly invest to implement / develop projects related to mercury (reduction of mercury emissions, manufacturing of mercury free devices), eligible under the VEPF and compliant with project objectives. 2,250,000 USD will instead come from state budget (MONRE, MOH, MOIT and Local governments).

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

The project will prevent the use of POPs in a number of manufacturing sectors (plastics, polymers, lighting, etc.), through establishing a green-labeling mechanism to be supported with zero-interest loans under VEPF and other financial mechanism. Activities aimed at promoting less-chemically intensive design for plastic and product will also ensure that not only the use of current POPs is limited, but also the future use of POPs precursors and POPs-like compounds in general. The prevention of the use and release of POPs will

therefore go much beyond the direct impact of the project. On the side of mercury, the project will speed-up the substitution from mercury toward non-mercury products (fluorescent lamps and mercury thermometers) and will also prevent the release of mercury and U-POPs in the environment, by supporting the design and installation of air pollution control system in industrial facilities and the demonstration of ESM of mercury waste. The project will also support recyclers in the ESM disposal of POPs-contaminated materials and end of life products through establishment of agreement and conventions with certified and BAT/BET compliant disposal facilities.

The quantification of the amount of mercury and POPs releases which can be avoided through the above activities will be assessed in detail at PPG stage, however the following reasonable targets for project direct impact can be already anticipated:

- Reduction of the release of mercury in the environment through shifting from mercury products vs. non mercury products: At least 20,000 fluorescent lamps and 10,000 thermometers will be collected and processed to segregate mercury;
- Direct or indirect reduction of new POPs, through the replacement of the use of SCCP and PFOS (either through safe chemicals or POPs-free processes and products), for an estimated amount of 8 tons of SCCP (mostly from the paint manufacturing sectors, chlor-rubber and acrylic protective coatings and in intumescent paints, but also from other processes / products like flame retardants, in polysulphide and polyurethane formulations, and in acrylic and butyl sealants and 2 tons of PFOS (mostly from hard chrome plating sector)
- Safe segregation and disposal of plastic and polymer articles containing potentially contaminated by POPs (c-PBDE, HBCD, PFOAs), or through the indirect reduction obtained through chemical substitution or product and material design: at least 500 tons of material with a concentration of BFR or PFOAs in the order of 5%; (25 tons of new POPs totally). These can be tentatively estimated (to be confirmed at PPG) as:
  - o 200 tons of EPS/XPS containing HBCD replaced with non-HBCD material, or disposed of in an environmentally sound way;
  - o 200 tons of plastic or foam contaminated by PBDE avoided through chemical and non-chemical alternatives or disposed of in an environmentally sound way;
  - o 100 tons of material contaminated by PFOAs avoided through chemical and non-chemical alternatives or disposed of in an environmentally sound way;
- Avoided emission of mercury and U-POPs in the environment through the establishment of APCS capable to reduce the concentration of mercury from an average 100µg/Nm<sup>3</sup> for mercury and 6.93 ngTeq/Nm<sup>3</sup> for PCDD/F (based on the average analytical result for incinerators based on the surveys carried out under the Viet Nam POPs and Sound Harmful Chemicals Management Project) to 10µg/Nm<sup>3</sup> for mercury and 0.1 ngTeq/Nm<sup>3</sup> for PCDD/F for a number of plant representing a flue gas flow rate of up to 1,000,000 Nm<sup>3</sup>/hr . (648 kg of mercury/year and 2 gTeq/year for PCDD/F.
- Beneficiaries. Including consumers and users of non-POP and non-mercury equipment (10,000 thermometers, 20,000 non mercury lamps, and 500 tons of non-POPs equipment), among the direct beneficiaries the direct beneficiaries can be estimated as following:

o For non-mercury equipment: 2 beneficiaries for each thermometer and 4 beneficiaries for each non-mercury lamps;

o For non-POPs equipment. Assuming conservatively that one kg of non-POP products would directly benefit one beneficiaries, 500 tons of POPs containing products would impact 500,000 persons. As far as U-POPs and mercury releases, considering that factories in Vietnam are often located in highly populated area, the decrease of mercury and U-POPs emission can potentially impact positively millions of beneficiaries (one million beneficiaries assumed).

o Therefore, an estimate of 1,600,000 direct beneficiaries can be considered a reasonable estimate. This estimate does not include beneficiaries benefitting from global scale effect of POP reduction.

#### **G) Innovation, sustainability and potential for scaling up**

- The proposal includes a mix of innovative and conventional approaches to reduce the use and release of POPs and mercury throughout the entire lifecycle of products and materials.
- The project will contribute to bring to Viet Nam to further disseminate the approach of green-labeling of products and materials (Oeko-Tex, brand-specific, Vietnam Ecolabeling). Although Ecolabeling is not new, is still rather an innovative approach in Viet Nam which will need more diffusion and implementation. To this end, and with the aim to prevent the use of POPs in plastic, foam and polymer articles, the project will conduct a survey to verify the list of chemicals used by plastic and polymer industry (in addition to POPs) on which there may be agreement for restriction or limitation in accordance with existing green-labeling schemes.
- The project will establish a shared network of knowledge among manufacturers, industries and designers on the design and manufacturing criteria which may be intrinsically less chemical intensive, for specific categories of products, product components and materials.
- This last approach is indeed highly innovative approach will promote a mindset shifting from conventional, chemical-based solutions to achieve desired properties of materials, to a more holistic approach based on a smarter selection of materials and design, to reduce the need for special properties and hence special chemicals. Material and products which may be considered eligible under green-labeling schemes will be identified and supported through the innovative financial mechanism developed under Output 1.2.3.
- On the side of mercury, the project intends to demonstrate small-scale, low cost mercury waste vacuum shredders to be used for extracting mercury from specific waste (lamps, thermometers) and ensure the recycling of material like glass, plastic and metal after segregation.

- On the side of segregation of PBDE contaminated plastic, a mix of procedures, ranging from the early identification of the origin of the plastic waste, preliminary classification based on the density, XRF testing will be developed for ensuring that plastic waste contaminated by BFR are segregated without affecting too much the recycling cost.

- All the above processes are highly innovative, although already available commercially, and have a high potential to be scaled up due to the fact that they can either generate value (through a better quality of the recycled material) or minimize the cost for environmental treatment.

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

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

It is expected that the project intervention will cover the entire country. A detailed map of the initiatives will be available at PPG, and updated 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.**

Involvement of key private and institutional stakeholders in the project design has been already started with the first “Project Consultation Workshop” which has been held in Hanoi in July 2019, after a number of meetings with MONRE and VEPF. The engagement of stakeholders will continue at PPG stages through meetings with all the potential project beneficiaries and partners or their representatives, to better understand how the project can be designed in detail to address all the barriers and needs identified so far. The PPG activities will also represent a first opportunity of awareness raising for the private sectors and governmental institutions: at that stage, industries will be informed about the risk and liabilities associated with the old production processes which may involve use of POPs or releases of U-POPs, and at the same time will be informed about the solution that the project is proposing through technical assistance and financial instruments. It is therefore expected that at PPG stage, the following workshop to involve stakeholders will be held: i. a PPG launching workshop with representatives of the key industrial sectors, governmental institutions and donors; a project consultation workshop near the end of PPG

activities to get feedback from all the stakeholders; face to face meetings and interview with each stakeholders; site visit to project implementation areas. It is expected that the following stakeholders will be involved:

1. Ministry of Natural Resources and Environment (MONRE), Vietnam Environment Administration (VEA), Vietnam Environment Protection Fund (VEPF).
2. Relevant ministries: Ministry of Industry and Trade (MOIT), Ministry of Health (MOH), Ministry of Science and Technology (MOST), Ministry of Labor Invalids and Social Affairs (MOLISA)
3. National Foundation for Science and Technology Development (NAFOSTED), managed by MOST
4. Vietnam Institute of Industrial Chemistry (VIIC)
5. Local Government Agencies at provinces (DOIT, DONRE, DOH and DOLISA)
6. Chemical Society of Vietnam (CSV) (so call Vietnam Chemical Association)
7. Sector Associations (i.e. Plastic Industry Association, etc. Vietnamese Pulp and Paper association, etc.)
8. Asian Institute of Technology in Vietnam (AIT VN) / Learning Centre (LC)
9. Vietnam Cleaner Production Centre (VN CPC)
10. Plant & Food Research (PFR)
11. Steel plating enterprises association
12. Hoa Phat Group (HPG)
13. Plastic, foam and polymer manufacturing industries.

### **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).**

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.

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.

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.

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? Yes**

**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.**

The project will work with a number of private institutions and firms, as well as with informal recyclers (trying to promoting their shifting to formal business).

- Representatives of private industries and industrial associations will be involved in the process of development of Ecolabeling and certification of POPs-free plastic, to ensure that the proposed certification schemes are feasible and to promote their adoption.
- Plastic, foam and polymer industry (automotive and electronic, building materials, upholstery)
- Furthermore, on the mercury side, it will be necessary to establish partnerships with manufacturers of fluorescent lights and LED lights, and mercury device thermometers, to better finalize the roadmap for mercury phasing out and verify whether any assistance would be needed for the management of mercury stockpile which could remain unused due to the reduction of market for mercury containing devices.
- Private clinics and hospitals will be also contacted to promote the shifting toward mercury alternatives

#### 5. Risks

**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)**

Outcomes	Unfavourable event	Category	Risk before mitigation			Proposed Mitigation	Risk after mitigation		
			Probability	Impact	Risk		Probability	Impact	Risk

1.1 and 1.2.	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	L	L	L
1.3	No agreement on Green Financing Framework Mechanism (GFFM)	Financial	L	M	M	Commitment has been already achieved with at least one financial institution. Details on the financial modalities and additional financial institutions to be identified at PPG	L	L/M	L/M
1.3	Few industries applying to the GFFM, not covering the offer	Financial	L	L/M	L/M	This is highly unlikely as the GFFM at zero-interest rate with a limited overall budget is expected to be completely consumed soon after launching. In the unlikely event that the offer exceeds the demand, refinement of the mechanism will be proposed and a second call launched to consume all the available resources.	L	L	L

2.1	Limited information achieved through the survey, few alternative design approved	Information	3	2	6	Industrial stakeholders, bilateral donors and Ministries (MONRE, MOIT) already committed to generate and share information. More involvement to be sought at PPG stage, including international investors, industrial associations, NGOs. A continuous effort will be needed as this is one of the key risk for the project	2	2	4
2.1	Few or no industries willing to adhere to horizontal recycling or take-back schemes	Technical	M	M	H	Contacts already started at PIF stage, however signed commitment to be achieved at PPG. Industries will be willing to participate because of EPR schemes to be enforced, and incentive schemes (through Green Financing Framework) to be implemented by the project. Horizontal recycling and take-back schemes to be designed in consultation with the relevant industrial sector.	L/M	L/M	L/M

2.2	No POPs waste identified or managed, no agreement with disposal service providers established.	Technical	L/M	L/M	L/M	Identification and disposal of POPs waste is not the main task of the project; what will be important is to ensure that the identification and disposal process are in place as a result of project implementation. In any case, there is already enough evidence that plastic, foam and polymer material contaminated by POP BFRs, PFOAs and SCCP have been manufactured or imported in Vietnam, and a large amount of analysis through XRF will be carried out to screen recyclable material processed by the recyclers.	L	L/M	L
3.1	Hospitals not willing to replace mercury thermometers with non-mercury thermometers	Technical	L/M	M	M	The replacement of mercury thermometers is only a matter of communication as the limited financial impact on the hospitals will be largely covered by the project. A massive training through a training for trainer mechanism will facilitate this replacement. GoV will support this measure which is compulsory by 2020 under the Minamata convention and is now urgent	L	L/M	L

3.1	Mercury released in the environment during demonstration of disposal activities	Technical	L	M	M	The technologies for the safe dismantling of mercury containing devices (lamps and thermometers) and for the segregation and safe storage of mercury are consolidated and commercially available. Additional and redundant measures to prevent any leaking or spillage of mercury during testing these technologies will be undertaken. Only closed-loop technologies will be tested.	L	L	L
All	Increased GHG or climatechange 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 be assessed also in term of energy consumption and release of GHG.	L	L	L
All	Project activity impacted by GHG or climate change	Climate	L	L/M	L/M	As no large infrastructure is envisage 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	Vietnam is a favourable 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. In term of GEB achievement, there will be no issue for mercury products, and mercury and U-POP releases. 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

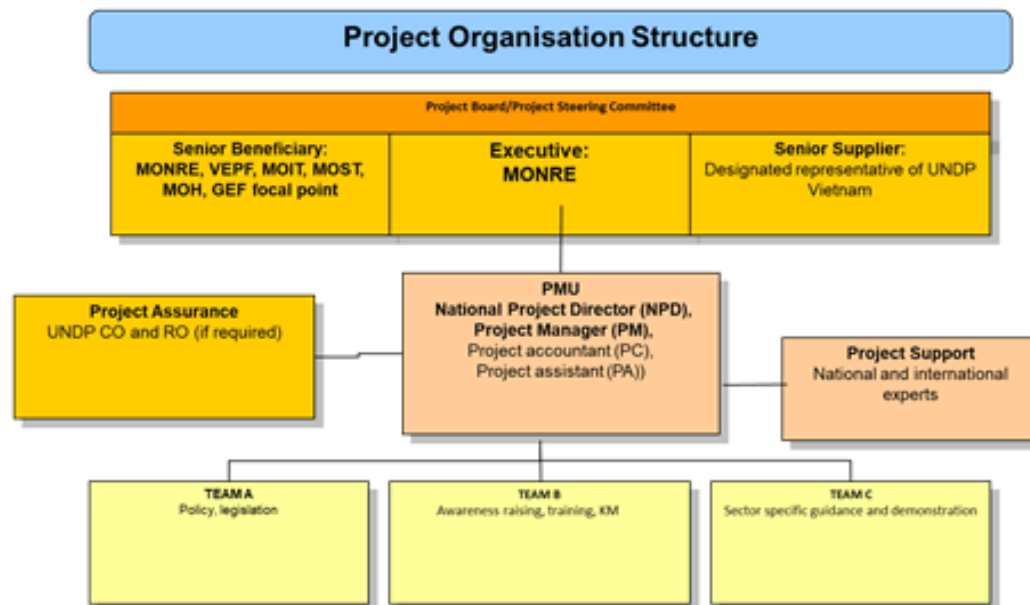
2.1 and 3.1	Increase of price of services and equipment to be procured under the GF fund	Financial	H	M	M	Surveys of prices of relevant services to be carried out before launching the Green Financial Mechanisms; standard prices to be set as part of the requirements; an independent appraisal committee established at PMU	L	M	L
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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.**

The project will be implemented by MONRE (VEA) as the main implementing partner but in partnership with MOIT (VINACHEMIA) and MOH (HEPA) consistent with its overarching purpose of integrating POPs/PTS and Mercury management into the country's evolving SCM framework and initiatives on mercury release reduction.

A preliminary organization chart of the project management structure is reported in the graph below:



The project will strictly coordinate with the UNDP-HCWH ongoing project “Strengthening Sustainability in the Health Sector in Developing Countries”.

The project will also work in tight coordination with of will build up from other GEF-financed projects in the country, like:

- Application of Green Chemistry in Vietnam to Support Green Growth and Reduction in the Use and Release of POPs/Harmful Chemicals (GEF 9379);
- Vietnam POPS and Sound Harmful Chemicals Management Project (GEF 5067);
- Implementation of Eco-industrial Park Initiative for Sustainable Industrial Zones in Vietnam (GEF 4766).

Coordination will be also sought with the UNEP project GEFID 10523. Indeed, the two projects are different in their objectives, as the UNEP project would be exclusively dealing with the Textile sector, whilst the UNDP cover a number of industrial sectors except textile. However, coordination and synergy can be established. The UNDP is concretely establishing a funding line for several POP-related sectors by extending permanently the eligibility criteria for application to the VEPF fund, whilst the UNEP will identify priority actions under a roadmap existing financial mechanism and assist SMEs in preparing applications. Further synergies can be identified in the part related to the drafting of improvement of current regulations and standards to include industrial products.



This project will therefore coordinate with the UNEP regional project on textiles via their respective KM components. UNDP and UNEP can share best practices and knowledge gained in the country to ensure a wider dissemination than any of the individual agencies would achieve.

## **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**

The project is consistent with the mandate of MONRE and VEPF. It should be noticed that VEPF (Vietnam Environmental Protection Fund) is a branch of the Ministry of Natural Resource and Environment) and as such, it's a permanent institution with the main role to facilitate investment in the environmental field, through technical assistance and competitive loans on eligible environmental projects. The interest rate is very competitive in the Vietnamese market, but still sustainable from the financial standpoint, and indeed can ensure a good interest rate in the international market. Therefore, any new sector or activity established as eligible under the VEPF scheme will remain a supported sector even before project ends.

The Government of Viet Nam signed the Stockholm Convention on May 23, 2001 and ratified the Convention on July 22, 2002. The country's first National Implementation Plan (NIP) for the implementation of the Stockholm Convention was prepared with the assistance of UNDP and submitted to the Stockholm Convention Secretariat in November 2007. The reviewed and updated NIP, which addresses all the COP amendment including COP 8, has been submitted to the Secretariat of the Stockholm Convention on 26/09/2018.

The project should be considered as a fundamental and necessary step toward the implementation of activities aimed at addressing the key priorities identified by the NIP updated in 2018, as following:

- Priority 1: Developing, supplementing and enhancing the effectiveness of regulations, policies and institutions to meet the new requirements of the Stockholm Convention. It includes activities like Review and assess the current regulations on the life - cycle management and control of POPs in Vietnam, and - Research, refer to international experience to develop/ supplement regulations on life - cycle control of POPs, develop of environmental standards and regulations on emissions;
- Priority 8: Reduction of use of materials, articles containing POP-BDEs, HBCD and PFOS in Vietnam and selection of sustainable alternatives. It includes the following activities: Assess and determine the use status of POP-BDE, HBCD and PFOS in industry and products in Vietnam; Assess and select alternative substances in industrial

production and products; Develop and apply measures to promote the alternatives of POP-BDE, HBCD and PFOS; - Develop regulations and policies to continuously reduce and eventually eliminate use of POP-BDE, HBCD and PFOS in the industry in Vietnam.

- Priority 9: Pollution control and treatment of materials and wastes containing POP-BDE, PFOS, HBB, HBCD, HCB, PCP. It includes the following activities: Collect information and inventory materials, waste containing POP-BDE, PFOS, HBB, HBCD, HCB, PCP in nation-wide; Develop and implement safety storage measures of materials, waste containing POP-BDE, PFOS, HBB, HBCD, HCB, PCP; Identify priority and implement treatment activities for the priorities; Establish and maintain a system of collecting, storage and enhancement of treatment capacity of material and waste containing POP-BDE, PFOS, HBB, HBCD, HCB, PCP.
- Priority 10: Conduct education, communication, awareness raising and enhancing the involvement of individuals, organizations and community on risk related to exposure of POPs and other hazardous chemicals;
- Priority 12: Sound management of chemicals, materials, equipment and wastes related to POPs and mercury generated from health care sector.

The project is still relevant for continuing to address priorities identified in the NIP completed in 2007, as below.

- Priority 1: Development and Finalization of Policies, Legislation and Institutions for POPs Management.
- Priority 8: Assessment, Study, Promotion, Assistance and Management on Application of Best Available Techniques and Best Environmental Practices to Reduce and Finally Eliminate the Unintentional Production of POPs from Production and Living Activities.
- Priority 10: Education, Training and Awareness Raising on POPs Issues.
- Priority 11: Enhancement of Technical and Financial Support to Implementation of the Stockholm Convention in Viet Nam.
- Priority 12: Strengthening Capacity for Managing and Controlling the Production, Import-Export, Use and Transport of Prohibited Chemicals Including POPs in Viet Nam.
- Priority 13: Study and Development of Emission and Technological Standards Associated with POPs in Line with Development and Integration Needs. Priority 14: Development of National Information System, Working Network on POPs and Promotion of Stakeholder and Public Participation in the Sound Management of POPs.
- Priority 15: Assessment of POPs Management in the whole Country.

Furthermore, the project is fully in-line with national strategies and plans, such as the:

- 1) National Strategy on Environment Protection (NSEP) to 2020, with Visions to 2030
- 2) Viet Nam Sustainable Development Strategy (2011- 2020)
- 3) Viet Nam Green Growth Strategy (VGGS)
- 4) National Action Plan (NAP) on Green Growth for the period of 2014 – 2020
- 5) National Socio-Economic Development Plan (2011-2015)
- 6) National Strategy on Cleaner Industrial Production to 2020
- 7) National Strategy on exports and imports for 2011-2020
- 8) National Action Plan on Sustainable Production and Consumption to 2020, with vision towards 2030

The project, in its components and outcomes related to the phasing out of mercury products, the improvement of the regulation on mercury emissions, and the improvement of air pollution control systems to reduce mercury emissions; is obviously in line with the Minamata Convention on Mercury, which has been signed by GoV the on October 11, 2013.

## **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.**

Management of knowledge generated for project clients and beneficiaries.

The prompt circulation of information generated by the project will ensure that project beneficiaries will achieve the maximum benefit out of project activities, so that the project impact will be maximized. The project will generate the following information which potential project “clients” and beneficiaries would need to know:

- Information on POPs free or less chemically intensive products and material. Will be shared through training workshop and awareness raising events, within a network of project partners (industries, certification bodies) and consumers through websites and apps with differentiated accesses;

- Information on the eligibility to financing programs established under the program. Will be shared during training events to be organized at VEPF, within the project website and the VEPF website, with differentiated access;
- Information on mercury free fluorescent lamps: will be shared during workshop and awareness raising events on mercury, and within manufacturer product websites, the project website, mobile apps and leaflets of retailer shops;
- Information and guideline on mercury thermometers, and disposal procedures for mercury thermometers: will be shared during training for trainers events, and to be summarized on panels and posters to be placed at healthcare facilities, and in healthcare facility websites when available. To be communicated with patients when admitted to the hospitals.

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.

Findings, lessons and strategies will be shared among this project and the UNEP project on the development of a sustainable textile industry (GEF 10523). Although the two projects have quite different objectives (the UNEP project would be exclusively dealing with the textile sector, whilst the UNDP will cover a number of industrial sectors except textile), as both the projects will be implemented by the MONRE and MOIT, the exchange of information among the two projects, with specific reference to the development of new regulations and standards, and the assistance to enterprises concerning the access to environmental funds, will be greatly facilitated.

This project will coordinate with the UNEP regional project on textiles via their respective KM components. UNDP and UNEP can share best practices and knowledge gained in the country to ensure a wider dissemination than any of the individual agencies would achieve.

**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
Nguyen Duc Thuan	Director of Vietnam Environmental Protection Fund	MINISTRY OF NATURAL RESOURCES	3/3/2020

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

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