



GEF-6 PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

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PART I: PROJECT INFORMATION

| | | | |
|-----------------------------|---|---|------------|
| Project Title: | Greening the scrap metal value chain through Promotion of BAT/BEP to Reduce U-POPs Releases from Recycling Facilities | | |
| Country(ies): | Thailand | GEF Project ID: ¹ | |
| GEF Agency(ies): | UNIDO (select) (select) | GEF Agency Project ID: | 150186 |
| Other Executing Partner(s): | Department of Primary Industries and Mines, Ministry of Industry | Submission Date: | 07-30-2015 |
| GEF Focal Area(s): | Chemicals and Wastes | Project Duration (Months) | 60 |
| Integrated Approach Pilot | IAP-Cities <input type="checkbox"/> IAP-Commodities <input type="checkbox"/> IAP-Food Security <input type="checkbox"/> | Corporate Program: SGP <input type="checkbox"/> | |
| Name of parent program: | [if applicable] | Agency Fee (\$) | 427,500 |

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES²

| Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs) | Trust Fund | (in \$) | |
|--|------------|-----------------------|--------------|
| | | GEF Project Financing | Co-financing |
| (select) CW-1 Program 1 (select) | GEFTF | 630,000 | 3,780,000 |
| (select) CW-2 Program 3 (select) | GEFTF | 3,870,000 | 23,220,000 |
| (select) (select) (select) | (select) | | |
| (select) (select) (select) | (select) | | |
| (select) (select) (select) | (select) | | |
| (select) (select) (select) | (select) | | |
| (select) (select) (select) | (select) | | |
| (select) (select) (select) | (select) | | |
| (select) (select) (select) | (select) | | |
| Total Project Cost | | 4,500,000 | 27,000,000 |

B. INDICATIVE PROJECT DESCRIPTION SUMMARY

| Project Objective: Promote and introduce BAT/BEP measures in scrap metal recycling facilities in order to reduce or eliminate unintentional POPs releases. | | | | | | |
|--|-----------------------------|---|--|------------|-----------------------|--------------|
| Project Components | Financing Type ³ | Project Outcomes | Project Outputs | Trust Fund | (in \$) | |
| | | | | | GEF Project Financing | Co-financing |
| 1. Policy and regulatory framework. | TA | 1. Policy and regulatory framework strengthened and enhanced for the implementation of a sound management of metal recycling. | 1.1 Improved and harmonized national policies and regulations for environmental and health protection from metal recovery activities. 1.2 Specific guidelines on environment, health and safety measures in the metal recycling chain | GEFTF | 250,000 | 1,500,000 |

¹ Project ID number will be assigned by GEFSEC and to be entered by Agency in subsequent document submissions.

² When completing Table A, refer to the excerpts on *GEF 6 Results Frameworks for GETF, LDCF and SCCE*.

³ Financing type can be either investment or technical assistance.

| | | | | | | |
|--|----------|--|--|----------|------------------|-------------------|
| | | | developed. | | | |
| 2. Information dissemination and capacity building | TA | 2.1 Increased awareness on BAT/BEP concepts by relevant stakeholders. 2.2 Improved national capacity in the management of the recycling chain of pre-consumer and post-consumer scrap metal | 2.1 Technical training for technicians and awareness raising workshops developed and implemented. 2.2. Awareness raising materials and technical guidelines formulated 2.3 Scrap metal value chain assessed and interventions identified. | GEFTF | 650,000 | 3,900,000 |
| 3. Pilot project for the demonstration of BAT/BEP in selected metal recycling facilities | Inv | 3. State-of-the art primary and secondary measures for U-POPs release reduction in selected facilities identified and deployed | 3.1 BAT/BEP measures identified and implemented for scrap collectors and scrap consumers. 3.2 Training of local stakeholders (government staff, SMEs, scrap collectors etc) and technical staff in the management of BAT/BEP measures undertaken. 3.3 Results of the implemented demonstration project published and disseminated for replication through collaboration with existing financial institutions in the country. | GEFTF | 3,150,000 | 18,000,000 |
| 4. Monitoring and Evaluation | TA | 4. Effective monitoring and evaluation of project impact and sustainability implemented. | 4.1 Project M&E designed and implemented. | GEFTF | 250,000 | 1,500,000 |
| | (select) | | | (select) | | |
| | (select) | | | (select) | | |
| | (select) | | | (select) | | |
| | (select) | | | (select) | | |
| | (select) | | | (select) | | |
| | (select) | | | (select) | | |
| | | | Subtotal | | 4,300,000 | 24,900,000 |
| | | | Project Management Cost (PMC) ⁴ | (select) | 200,000 | 2,100,000 |
| | | | Total Project Cost | | 4,500,000 | 27,000,000 |

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust funds here: ()

⁴ For GEF Project Financing up to \$2 million, PMC could be up to 10% of the subtotal; above \$2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

C. INDICATIVE SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE, IF AVAILABLE

| Sources of Co-financing | Name of Co-financier | Type of Co-financing | Amount (\$) |
|---------------------------|--|----------------------|-------------------|
| Recipient Government | Department of Primary Industries and Mines, Ministry of Industry | In-kind | 4,500,000 |
| Private Sector | Metal Recycling enterprises | Equity | 22,280,000 |
| GEF Agency | UNIDO | Grants | 85,000 |
| GEF Agency | UNIDO | In-kind | 135,000 |
| (select) | | (select) | |
| (select) | | (select) | |
| Total Co-financing | | | 27,000,000 |

D. INDICATIVE TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS ^{a)}

| GEF Agency | Trust Fund | Country/Regional/Global | Focal Area | Programming of Funds | (in \$) | | |
|----------------------------|------------|-------------------------|----------------------|------------------------|---------------------------|------------------------------|------------------|
| | | | | | GEF Project Financing (a) | Agency Fee (b) ^{b)} | Total (c)=a+b |
| UNIDO | GEFTF | Thailand | Chemicals and Wastes | POPS | 4,500,000 | 427,500 | 4,927,500 |
| (select) | (select) | | (select) | (select as applicable) | | | 0 |
| (select) | (select) | | (select) | (select as applicable) | | | 0 |
| (select) | (select) | | (select) | (select as applicable) | | | 0 |
| (select) | (select) | | (select) | (select as applicable) | | | 0 |
| Total GEF Resources | | | | | 4,500,000 | 427,500 | 4,927,500 |

a) Refer to the Fee Policy for GEF Partner Agencies.

E. PROJECT PREPARATION GRANT (PPG)⁵

Is Project Preparation Grant requested? Yes No If no, skip item E.

PPG AMOUNT REQUESTED BY AGENCY(IES), TRUST FUND, COUNTRY(IES) AND THE PROGRAMMING OF FUNDS

| Project Preparation Grant amount requested: \$150,000 | | | | | PPG Agency Fee: 14,250 | | |
|---|------------|-------------------------|---------------------|------------------------|------------------------|-----------------------------|-----------------|
| GEF Agency | Trust Fund | Country/Regional/Global | Focal Area | Programming of Funds | (in \$) | | |
| | | | | | PPG (a) | Agency Fee ⁶ (b) | Total c = a + b |
| UNIDO | GEF TF | Thailand | Chemicals and Waste | POPS | 150,000 | 14,250 | 164,250 |
| (select) | (select) | | (select) | (select as applicable) | | | 0 |
| (select) | (select) | | (select) | (select as applicable) | | | 0 |
| Total PPG Amount | | | | | 150,000 | 14,250 | 164,250 |

⁵ PPG requested amount is determined by the size of the GEF Project Financing (PF) as follows: Up to \$50k for PF up to \$2m (for MSP); up to \$100k for PF up to \$3m; \$150k for PF up to \$6m; \$200k for PF up to \$10m; and \$300k for PF above \$10m. On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

⁶ PPG fee percentage follows the percentage of the Agency fee over the GEF Project Financing amount requested.

F. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS⁷

Provide the expected project targets as appropriate.

| Corporate Results | Replenishment Targets | Project Targets |
|---|--|---|
| 1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society | Improved management of landscapes and seascapes covering 300 million hectares | <i>Hectares</i> |
| 2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes) | 120 million hectares under sustainable land management | <i>Hectares</i> |
| 3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services | Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins; | <i>Number of freshwater basins</i> |
| | 20% of globally over-exploited fisheries (by volume) moved to more sustainable levels | <i>Percent of fisheries, by volume</i> |
| 4. Support to transformational shifts towards a low-emission and resilient development path | 750 million tons of CO _{2e} mitigated (include both direct and indirect) | <i>metric tons</i> |
| 5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern | Disposal of 80,000 tons of POPs (PCB, obsolete pesticides) | <i>Reduction of about 20 g TEQ/year of PCDD/Fs released from demonstration facilities</i> |
| | Reduction of 1000 tons of Mercury | <i>metric tons</i> |
| | Phase-out of 303.44 tons of ODP (HCFC) | <i>ODP tons</i> |
| 6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks | Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries | <i>Number of Countries:</i> |
| | Functional environmental information systems are established to support decision-making in at least 10 countries | <i>Number of Countries:</i> |

PART II: PROJECT JUSTIFICATION

1. *Project Description*. Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, GEF focal area⁸ strategies, with a brief description of expected outcomes and components of the project, 4) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing; 5) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up.

1) The global environmental and/or adaptation problems, root causes and barriers that need to be addressed

1. Metals recycling is generally considered a “green” industry since it allows saving of natural resources (energy and raw materials). However, if not properly conducted, metal recycling processes are important sources of environmental pollution. Secondary steel production, secondary aluminum production, and secondary copper and copper alloy production are recognized as important sources of U-POPs (Annex C, Part II and Part III of the Stockholm Convention ; Section V and Section VI of the BAT/BEP Guidance/Guidelines ; and UNEP Dioxin

⁷ Provide those indicator values in this table to the extent applicable to your proposed project. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the *GEF-6 Programming Directions*, will be aggregated and reported during mid-term and at the conclusion of the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF and/or SCCF.

⁸ For biodiversity projects, in addition to explaining the project's consistency with the biodiversity focal area strategy, objectives and programs, please also describe which Aichi Target(s) the project will directly contribute to achieving.

Toolkit). Furthermore, secondary ferrous and non-ferrous metal production are also significant sources of other pollutants, such as particulate matter, organic compounds such as VOCs and PAHs, heavy metals and mercury, impacting on the worker's health and the global environment.

2. Secondary metals producers use a wide range of raw materials including scrap metal, skimmings, filter dusts, drosses and process scrap (e.g. swarf, grindings and turnings). The presence of contaminating substances such as oils, plastics, paints, lacquers, etc. may lead to the formation and emission of U-POPs during the melting process.
3. Secondary metal production in Thailand is based on domestic and imported scrap. Scraps are qualified according to different criteria (e.g. size, weight, chemical composition, degree of cleanliness). In Thailand, there is actually a network of collectors which collect scrap metal from manufacturers (i.e. off-cuts from the automotive industry) or from the municipal waste stream (end-of-life products, sometimes referred to as urban mines). Small collectors, which represent the majority of registered companies in this sector, are mainly specialized in the collection of old scrap (i.e. post-consumer scrap from end-of-life products or construction and demolition metal scrap consisting of the scrap generated during the construction, renovation, and demolition of buildings, roads, and bridges). The different kinds of scrap are often stored outside on unpaved and uncovered stockyards. Leachable compounds such as oil/emulsions or other residual materials can contaminate the soil and the groundwater through the runoff water.
4. Taking into account the magnitude of the U-POPs problem and given the absence of appropriate countermeasures, the releases to the environment of U-POPs and other pollutants of concerns from the secondary metallurgical industry is expected to increase substantially in the future. As a consequence of the expected increase of secondary metals production, the Government of Thailand places priority to the implementation of BAT/BEP measures to reduce U-POPs releases from the national metallurgical industry in order to reduce possible negative effects on human health and the environment at national, regional and global scale.

2) The baseline scenario or any associated baseline project

Overview of the metallurgical industry of Thailand

5. The metallurgical sector is an important part of Thailand's economy. This sector produces ferrous and non-ferrous metals such as steel, copper alloys and aluminum, which are needed for the development of the country's infrastructure. While accounting only to 4.7% of the manufacturing industry and about 1.4% of the country's GDP, the metal industry is important to Thailand's economy. It supports many downstream industries such as automotive, construction, electrical and electronic industry, etc.
6. Thailand has both ferrous and non-ferrous metals industries. For ferrous metals, there are 704 iron and steel facilities, of which 93% are SMEs. For non-ferrous metals, most of them are aluminum and brass facilities. Aluminium industry is the largest non-ferrous metal industry in Thailand with current 371 facilities and 12,981 worker employed (Source: Department of Industrial Works' database)

Number of facilities

| | Small | Medium | Large | Total |
|------------------|-------|--------|-------|------------|
| Iron and steel | 504 | 151 | 49 | 704 |
| Aluminum | 316 | 43 | 12 | 371 |
| Brass and Bronze | 234 | 16 | 3 | 253 |
| Copper | 70 | 15 | 2 | 87 |
| Lead | 16 | 6 | - | 22 |

Employment

| | Small | Medium | Large | Total |
|------------------|-------|--------|--------|---------------|
| Iron and steel | 9,330 | 13,696 | 21,701 | 44,727 |
| Aluminum | 3,940 | 4,572 | 4,469 | 12,981 |
| Brass and Bronze | 3,033 | 1,457 | 1,000 | 5,490 |
| Copper | 1,041 | 1,516 | 738 | 3,295 |
| Lead | 238 | 464 | - | 702 |

7. According to World Steel Association database⁹, Thailand is the third largest steel producer in South East Asia. In 2013, Thailand produced 3.6 million tons of crude steel which is lower than Malaysia (4.7 million tons) and Viet Nam (5.5 million tons). However, in terms of consumption, Thailand is the largest steel consumer in the region with an apparent steel use of about 20.5 million tons of crude steel (apparent steel use per capita: 291.4 kg crude steel) which is higher than Indonesia (15.2 million tons, 61.6 kg per capita), and Viet Nam (13.7 million tons, 151.0 kg per capita). To meet the demand for steel, Thailand imported about 15.9 Mt of semi-finished and finished steel products in 2013.
8. The Iron and Steel Institute of Thailand (ISIT) has found that the construction sector was the largest consumer of steel in 2013, accounting for 50.9% of total steel consumption, followed by the automotive sector (22.4%) and machinery&industry (11.7%). The SEAISI has forecasted that Thailand's steel demand will increase about 2.5-3.0% per year during 2014-2017 which is lower than demand in Indonesia (6-7%), Viet Nam (5-6%) and Malaysia (4%). It is expected that Thailand will continue to enhance its self-sufficiency in domestic supply for steel in the coming years to serve its growing demand and to substitute import.
9. Thailand is a scrap-based steel producing and consuming country. NTS Steel Co. Ltd. (Tata Steel Group) has shut down its Mini Blast Furnace operations since August 2011 due to the high variability in the price of iron ore and coke. As a results, Thailand does not have an integrated iron & steel industry and rely heavily on steel scrap. Iron and steel scrap is generally melted in electric arc furnaces to produce secondary steel. According to the South East Asia Iron and Steel Institute (SEAISI) Statistics, in 2011, Thailand was the second largest scrap steel consumer in Southeast Asia (Indonesia is the largest) with a total consumption of 4.3 million tons of scrap steel.
10. Production of secondary aluminum from both post-consumer scrap (discarded aluminum products) and new (manufacturing) scrap is expected to increase in Thailand in the coming years to support the ongoing industrialization process and the economic growth and to substitute import of unwrought aluminum. The economic incentives for recycling aluminum are currently more important than environmental considerations. The energy savings in the production of aluminum from scrap can reach as much as 90-95 per cent in comparison with primary production. However, secondary aluminum producers still need to develop production techniques to enhance performance and reduce environmental problems.
11. The aluminum industry in the country continues to grow continually as a result of high consumption demand of related industries such as construction industry, packaging industry, and electrical appliance industry. There is no primary aluminum production in Thailand because of shortage of bauxite raw material sources and high electricity costs in the country. Therefore, aluminum industry in Thailand relies on imported semi-finished raw materials (unwrought aluminum) and secondary aluminum production from re-melting aluminum scrap.
12. Aluminum scrap recycling (new and old scrap), however, is not fully implemented in the country despite the domestic quantity of aluminum scrap of about 100,000 tons per year. In 2008, 101,207 tons of aluminum scrap were imported. In the same year, 30,655 tons of aluminum scrap were exported because of insufficient domestic

⁹ World Steel Association (Worldsteel). Steel Statistical Yearbook 2014. Worldsteel Committee on Economic Studies, Brussels, 2014

use. The aluminum industry in 2008 was also sustained by the import of 437,359 tons of unwrought aluminum (aluminum and aluminum alloys). In 2012, aluminium production increased about 10% from previous year, due to recovery of demand from automotive, construction, electrical, and packaging sector. Import of unwrought aluminium was 521,666 tons, increasing 12.0%, while import of aluminium scrap reduced 30.1% to 71,343 tons.

13. After the shutdown of Thai Copper Industries Co. Ltd. (design capacity of 165,000 tons of copper cathodes per year) in 2007 due to environmental problems, there is no primary copper production in Thailand. Most of the refined copper needs in Thailand is from import. To meet the domestic demand, in 2012, Thailand imported 246,059 tons of unwrought copper, with an increase of 3.9% from previous year. The most important sources are Lao PDR, Australia, and Japan. Currently, there are 87 copper facilities and 3,295 employment in the sector. Copper and copper alloys (brass and bronze) are continuously recycled in the country for the production of goods for industrial and construction uses and for decorative purposes.

Dioxin Inventory

14. The most recent PCDDs/PCDFs emission inventory for Thailand has been carried out in 2005. Potential national releases of PCDDs/PCDFs emission to air, water, land, product and residue were estimated at 1075.88 g I-TEQ/year as reported in the NIP. The total release from the ferrous and non-ferrous metal production was estimated at 119.84 g I-TEQ/year, accounting for 11.14 % of the total national release.

The currently available information on PCDD/PCDFs releases from ferrous and non-ferrous metal production is summarized in the Table below.

Annual releases of PCDD/F in Thailand from source category 2 – Ferrous and non-ferrous metal production (Base year: 2004).

| | Production (ton/year) | Annual releases of PCDD/F (g TEQ/year) | | |
|------------------------------------|-----------------------|--|----------|--------------|
| | | Air | Residues | Total |
| Iron and steel production | 6,583,739 | 19.773 | 98.756 | 118.529 |
| Iron and steel foundries | 3,562 | 0.0025 | 0.021 | 0.0235 |
| Secondary copper production | 1,200 | 0.060 | 0.756 | 0.816 |
| Secondary aluminum production | 258 | 0.009 | 0.103 | 0.112 |
| Secondary lead production | 24,072 | 0.193 | ND | 0.193 |
| Brass and bronze production | 500 | 0.0005 | ND | 0.0005 |
| Total for source category 2 | | 20.04 | 99.66 | 119.7 |

Source: Technical Report. Establishment of POPs inventories and assessment of infrastructure and capacity. NIP/POPs Coordination Office. July 2005.

15. According to the available data, secondary steel production in electric arc furnaces represents almost all of PCDD/Fs releases from source category 2 – ferrous and non ferrous metals production. However, data in the dioxin emission inventory reported in the NIP are highly incomplete with regard to non-ferrous metals production. Many small recycling shops that produce and sell quite large amount of secondary non-ferrous metals are active in Thailand but the actual activity rate was unknown at the time of the development of the dioxin inventory. This might be a relevant source of PCDD/Fs releases.
16. Measurements performed during the Thailand dioxin sampling and analysis program¹⁰ gave PCDDs/PCDFs stack emission concentrations of 0.32 to 0.61 ng I-TEQ/m³ (average 0.50 ng I-TEQ/m³) from a secondary steel plant

¹⁰ Thailand Dioxin Sampling and Analysis Program. UNEP Chemicals, Geneva, September 2001. Available on line at <http://www.chem.unep.ch/pops/pdf/thdioxsamprog.pdf>

and stack concentrations of 0.13 to 0.21 ng I-TEQ/Nm³ (average 0.15 ng I-TEQ/Nm³) from a secondary brass smelter. In 2009, the Pollution Control Department (PCD) conducted analysis of PCDD/PCDFs emission in the steel sector. They found that the emissions of PCDD/PCDF from a steel producer using the electric arc furnace (EAF) were around 0.52 ng I-TEQ/m³, which is higher than the international standards.

Baseline Projects

17. In order to control the emissions of pollutants into the atmosphere from industries, the Ministry of Natural Resources and Environment (MONRE) of Thailand in 2006 has identified several substances to be controlled in industrial emissions; particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, hydrogen sulfide, hydrogen chloride, sulfuric acid, xylene, cresol, antimony, arsenic, copper, lead, and mercury. Unfortunately, dioxins and furans are not in the list. Currently, there are 5 sectors being regulated in terms of U-POPs emissions in Thailand. No regulatory standard has been issued specific to U-POPs for the ferrous and non-ferrous metal production industry.

U-POPs laws and regulations implemented in Thailand

| | Year | Control source | Standard value (ng TEQ/Nm ³) |
|--|------|---|--|
| Notification of the Ministry of Science, Technology, and Environment | 1997 | Municipal waste incinerators | 30 |
| Notification of Ministry of Industry | 2002 | Kilns that burn waste or hazardous residues from industry | 0.5 |
| Notification of Ministry of Natural resource and Environment | 2003 | Medical waste incinerators | 0.5 |
| Notification of Ministry of Industry | 2005 | Industrial plants that use processed used-oil or synthetic fuel | 0.5 |
| Notification of Ministry of Natural resource and Environment | 2006 | Cement plants | 0.5 |

18. The Department of Primary Industries and Mines (DPIM) under the Ministry of Industry is the main governmental office that controls and supervises industry practices according to the Minerals Act of Thailand. While several initiatives on this issue has been undertaken by the department, there is currently no policy (only a guideline) on scrap metal recycling.

Raising awareness and capacity building on productivity and efficiency improvement in the metallurgical sector is one of the major roles of DPIM. It has been promoting recycling technology research and usage of metal scrap as replacement of natural raw materials. The department has also, so far, initiated the following activities related to scrap metals; - The Classification of Thailand Steel Scrap Project, phase I, 2007-2008 - The Classification of Thailand Steel Scrap Project, phase II, 2009-2010 - The Best Practice of Efficiency Improvement in Steel Processing Project (related with steel scrap classification), 2011 - The Efficiency Improvement for Mineral Dressing and Steel Processing Project, 2012-2013. Recently, DPIM has done some research about metal recycling, including recovery of precious metals from industrial waste and e-scrap (electronic devices, PCB, CPU, etc.) project. However, information and knowledge on issues of POPs and concepts of BAT and BEP are, generally, still not a component of the department's activity. Coordination with the Pollution Control Department of the Ministry of Environment which is mandated to conduct awareness raising activities on POPs, is important to ensure that relevant sectors are informed of these issues.

19. In Thailand, secondary metal production is performed in a number of large-size facilities as well as in many small- and medium-size enterprises and also in microenterprises with very limited production and a small

number of employees (fewer than 10 persons). While some large-size facilities operates state-of-the-art technologies which contribute to sustainable production in the metallurgical sector and help in reducing the releases of conventional pollutants, small and medium size facilities often employ obsolete processes and technologies and have very limited, even non-existent, preventive measures that could be effective in reducing PCDD/F formation and releases from their metallurgical processes. Small-scale metal recycling facilities do not have the technical capability to properly operate advanced reduction techniques. In addition, the small scale of these facilities can not justify the investment in advanced technology. Likewise, one of the main problems encountered in these small size facilities is that scrap metal is often contaminated with oil, grease, paints and lacquers and does not undergo any pre-treatment stage. Scrap contamination, coupled with the simple technology of the melting processes, leads to very high pollutant formation and emission, including dioxins. The collection and treatment of gases and fumes released during the melting process is often not sufficient, leading to high releases of fumes and dust in the working environment and outside.

20. A preliminary survey conducted during the PIF formulation in a number of small and medium size secondary metals production facilities reinforced the situation stated above. Many of the facilities visited process scrap metal which is often contaminated and does not undergo any pretreatment stage. The situation in the facilities is made worse by the use of off-gas collection and treatment not adequately robust to deal with the emissions from the furnace. The result is a significant emissions of smoke (and U-POPs) during the melting process. It is also apparent that metal recycling facilities lack awareness of the local and global problem posed by the U-POPs formed and released during their production processes. Moreover, they have a limited technical capabilities to properly operate advanced techniques for environmental protection and have a limited knowledge of the internationally-recognized BAT/BEP related to their processes for the reduction of U-POPs releases.
21. In any case, the production processes and the “end-of-pipe” technologies used in the ferrous and non-ferrous metal industry in Thailand are not designed for the reduction of U-POPs formation and releases from their metallurgical processes. Until now, no activities has been performed in Thailand to control and reduce U-POPs releases from the secondary ferrous and non-ferrous metal industry especially in small and medium enterprises. Initial discussions with possible industry partners indicated that scrap metal processing is an important issue that needs to be addressed. One company has indicated the plan to procure a scrap metal cleaning system in order to remove contaminants which may cause emission of undesirable pollutants including dioxins. Another possible partner indicated the need to introduce a scrap cleaning system to scrap suppliers to provide a holistic scrap management in the country.

3) *The proposed alternative scenario, with a brief description of expected outcomes and components of the project*

The project is designed for Thailand to meet its obligations under the SC and for the implementation of the identified priority action plans in its NIP that need urgent actions. The project, in general, seeks to abate serious environmental threats caused by U-POPs releases from the metallurgical sector. It aims to assess in-depth the scrap metal value chain from generators, collectors and users and provide measures that would make the processes involved in each link more environmentally-compliant and sustainable.

22. As core activity, the proposed project aims to identify, implement and demonstrate state-of-the-art technologies for reducing U-POPs releases from scrap metal recycling in the metallurgical industry according to the obligations of the Stockholm Convention and to promote and introduce BAT/BEP measures to reduce U-POPs emissions in SMEs and large enterprises involved in metallurgical processes. The guiding principles for the selection of the demonstration facilities as well as the techniques/technologies to be deployed during the demonstration project will be the technical viability, the economic sustainability, the replicability of the demo results; cost-effectiveness in terms of reduction of U-POPs releases; and, of course, the level of support from the industry sector. Business models will be elaborated and evaluated, including the possibility of formation of consortia between secondary metals producers and scrap dealers.
23. The goal of the proposed project is to bring two demonstration facilities from the current, baseline technology level to a BAT-based level. In the language of the UNEP Dioxin Toolkit, this means to bring the selected

facilities from the class to which the existing facilities belongs (supposed to be Class 1) to or close to a higher class number (Class 3). The Table below reports the potential for PCDD/F release reduction attainable with the implementation of the proposed project in different sub-categories of the secondary ferrous and non-ferrous metal production sector.

Estimated potential of reduction of PCDD/Fs release with the proposed project according to default emission factors reported in the UNEP Dioxin Toolkit, January 2013.

| Source category | Estimated typical capacity | Emission to air from a typical/average facility g TEQ/a | | Emission to residues from a typical/average facility, g TEQ/a | | Potential PCDD/Fs reduction (total) from a typical facility g TEQ/a |
|--------------------|----------------------------|---|---------|---|---------|---|
| | | Class 1 | Class 3 | Class 1 | Class 3 | |
| Secondary steel | 500,000 t/a | 5.0 | 0.05 | 7.5 | 0.05 | 12.4 |
| Secondary aluminum | 50,000 t/a | 5.0 | 0.025 | 10.0 | 5.0 | 9.975 |
| Secondary copper | 10,000 t/a | 8.0 | 0.05 | 6.3 | 3.0 | 11.25 |

24. The expected reduction of PCDD/F emission to air from the two demonstration facilities would be higher than 99%. A high reduction possibility of PCDD/F associated with the process residues is also expected. An environmentally sound management of such residues (mainly filter dust), an aspect that will also be addressed during project implementation, will further reduce the environmental burden of the ferrous and non-ferrous metal industry in Thailand.

BAT/BEP measures that will be implemented in the two demonstration facilities will be chosen from those reported in the “Guidelines on Best Available Techniques and Provisional Guidance on Best Environmental Practices” developed in the framework of the Stockholm Convention. Both primary measures that prevent the formation of chemicals listed in Annex C; and secondary measures that control and reduce the release of those chemicals will be considered and evaluated.

25. Particular emphasis will be given to the identification of technologies for scrap pre-treatment prior to melting, with a particular focus on the needs of small- and medium-size facilities. Secondary raw materials often are in a form that is not suitable for a direct use in the main process so a pre-treatment step is generally required. Pre-treatment processes include the removal of contaminants by heating, crushing, screening, milling, sorting, etc. The process chosen depends on the nature and quality of the raw material ultimately used and particularly the degree of contamination.

Scrap pre-treatment and in general all measures that can be adopted to improve the quality of raw materials in the secondary metallurgical industry (sorting, selection and preparation, including de-coating and de-oiling, stripping cable insulation, mixing, etc) are important primary or process-integrated measures that attempt to prevent or minimize the formation of pollutants, including U-POPs, during the melting process. Primary measures alone may not be sufficient for the complete elimination of emissions of U-POPs from the metallurgical industry but they represent a fundamental step for the reduction of the formation of these unwanted chemicals, in line with the requirement of the Stockholm Convention.

26. One approach to mitigate the problem, at least for certain types of production (secondary aluminium, secondary copper and secondary bronze/brass) and for certain types of scrap (used beverage cans, oil contaminated turnings, etc.) would be to feed the furnace with sorted and cleaned scrap instead with unsorted, dirty scrap. Scrap pre-treatment might be carried out in a dedicated plant. Most common technology is thermal de-coating of scrap in a dryer/delacquering/decoating rotary kiln at a temperature of approx. 500°C. The kiln must be equipped with a post-combustion chamber and activated carbon injection for an effective dioxin control. Due to the small size of secondary metals facilities, a single decoating plant could satisfy the needs of several small secondary metals producers. The pool (central) facility could be equipped with other equipment for the beneficiation of

scrap, such as shears, shredders, separators (air classifiers, magnetic separators, eddy-current separators, etc.) or facilities for copper wire recycling (separation from plastic insulators), and so on. The decoating plant and pre-treatment equipment have to be purchased, thus increasing the price of pre-treated scrap. However, the economic benefits (beside the environmental and health benefits) will be more than the cost of the decoating equipment. For instance, processing used beverage cans not decoated prior to melting will lead to metal loss between 15-30%. A well managed melting process of decoated scrap can limit metal loss to less than 6%. Another benefit is that clean materials will melt more rapidly giving an increased melt rate and thus making more effective the same furnace. Decoated and delacquered materials will also reduce the usage of salt/fluxes required in the melting process. Finally, clean scrap give a cleaner working environment combined with lower plant emissions.

27. The proposed project aims at delivering a comprehensive overview of the scrap metal recycling industry in Thailand, with an assessment of scrap sources, recycling processes, standards used by industry, economic and market aspects, health and environmental issues and related legislation and regulation. Based on this assessment, the project will implement activities to strengthen the policy and institutional framework to support the environmentally sound management of metal recycling in Thailand. The project will also support the implementation of a well-organized scrap metal recycling chain in order to maximize resource efficiency, encourage waste minimization while reducing and controlling emissions and waste generation during the scrap recycling process.
28. The proposed project also aims at disseminating information on the adverse effects of U-POPs to human health and the environment. Awareness raising and capacity building activities for the public and private sectors will be carried out to support the implementation of measures for a sound development of the scrap metal recycling chain. Awareness raising material, training material and technical guidelines will be developed and made available to the relevant stakeholders. Local stakeholders and technical staff will be trained on the management of BAT/BEP measures in scrap metal recycling facilities in order to reduce or eliminate unintentional POPs releases and on issues such as environment, health and safety.
29. The project will be monitored, documented and evaluated through the design and application of suitable indicators, including the evaluation of the reduced U-POPs releases. The results and the lessons learned during the implementation of the project will be published and disseminated for a nation-wide replication strategy. Furthermore, project outcomes will be made globally available through reporting to the COP of the Stockholm Convention.
30. The activities planned under the project and a summary of the outputs for each component of the project are listed below.

Component 1. Policy and regulatory framework:

Outcome 1. Policy and regulatory framework strengthened and enhanced for the implementation of a sound management of metal recycling.

Output 1.1. improved and harmonized national policies and regulations for environmental and health protection from metal recovery activities.

- The proposed project will support the improvement of the current governance for an environmentally sound management of metal recycling in Thailand and the effective reduction of U-POPs from this industry sector. The activities would assist to facilitate the diffusion and enforcement of BAT/BEP and the development of national standards. Potential regulatory instruments that maybe introduced to encourage compliance with the policies/regulations will be identified, as well.

Output 1.2. Specific guidelines on environment, health and safety measures in the metal recycling chain developed.

- Technical information on the environmentally sound management of metal scrap recycling will be codified and disseminated through the development of specific guidelines dealing with environmental, health and safety measures.

Component 2. Awareness raising and capacity building

Outcome 2.1. Increased awareness on BAT/BEP concepts by relevant stakeholders.

Output 2.1. Technical training for technicians in the relevant industries and awareness raising workshops developed and implemented.

- Technical information on BAT/BEP concepts will be disseminated through workshops for technical staff of SMEs dealing with this sector. In-plant training within individual participating facilities. This component will help Thailand to develop a qualified base of professional experts in the field of BAT/BEP measures to the industry sector.
- Awareness raising activities for the public sector will be carried out to disseminate information on the adverse effects of U-POPs to human health and the environment and to encourage the collection of post-consumer metal scrap for recycling and consumer education.

Output 2.2. Awareness raising materials and technical guidelines formulated.

- Technical information will be disseminated through the preparation of technical guidelines tailored to the need of relevant stakeholders and technical staff to support the implementation of measures for a sound development of the scrap metal recycling chain.
- Awareness raising materials will be developed and disseminated to relevant stakeholders.

Outcome 2.2. Improved national capacity in the management of the recycling chain of pre-consumer and post-consumer scrap metal

Output 2.3. Scrap metal value chain assessed and interventions identified.

- Comprehensive overview of the scrap metal recycling industry in Thailand. This study would include a in-depth assessment of the scrap metal value chain from generators, collectors and consumers. Based on this assessment, the project will implement activities to improve and support the environmentally sound management of the recycling chain of pre-consumer and post-consumer scrap metal in Thailand.

Component 3: . Pilot project for the demonstration of BAT/BEP in selected metal recycling facilities

Outcome 3. BAT/BEP measures for U-POPs releases reduction in selected facilities identified and deployed

Output 3.1. BAT/BEP measures identified and implemented.

- BAT/BEP measures will be identified, implemented and demonstrated in two selected facilities. The selection of the demonstration facilities as well as the selection of the techniques and technologies that will be implemented will be agreed during the PPG stage. Both primary and secondary measures will be considered and evaluated, taking into account the technical and economic feasibility of the various options under the specific conditions present at each selected demonstration facility. Co-benefits of controlling other pollutants and cross-cutting issues will be also evaluated. Approaches that maybe employed are presented in the discussion above.

Output 3.2. Training of local stakeholders, including government staff, SMEs, scrap collectors etc, and technical staff in the management of BAT/BEP measures undertaken.

- Training and capacity building of local stakeholders and technical staff will be conducted at both facilities on BAT/BEP issues and on a more efficient use of materials and energy.

Output 3.3. Results of the implemented demonstration project published and disseminated for replication through collaboration with existing financial institutions in the country and to update further revisions of the BAT/BEP guidelines and guidance.

- Experience and lessons learned during the project development will be disseminated through a series of national and international workshops and published in order to facilitate the replication of the results of the pilot activities for a nation-wide replication strategy as well as in other developing countries for a smooth introduction of

BAT/BEP in the metal recycling value chain. Collaboration with national financial institutions for the replication of the measures in other relevant facilities in the sector is envisaged and will be fully explored during the PPG phase.

Component 4. Monitoring and evaluation

Outcome 4. Effective monitoring and evaluation of project impact and sustainability implemented

Output 4.1. Project M&E designed and implemented.

- An effective monitoring and evaluation process of project impact and sustainability will be designed and implemented, including setting a periodic review process to monitor the quality and the state of progress of the project. Gender issues and environmental and social safeguards will be fully integrated in the project's activities.

4) Incremental/additional cost reasoning and expected contributions from the baseline

31. In the “business-as-usual” scenario, the development of the secondary ferrous and non-ferrous metals industry in Thailand will proceed as usual, focused primarily on economic performance leaving out other issues as unnecessary. The releases to the environment of U-POPs and other pollutants of concern from this industry sector are expected to increase substantially in the next future, leading to negative effects on human health and the environment at national, regional and global scale. It is unlike that existing secondary metals producing companies will implement BAT/PEP measures to reduce U-POPs releases. Only few large companies that have particular interest and technical capacity to improve the performance of their processes or new plants that need to comply with the obligations of the Stockholm Convention will adopt primary measures such as scrap pre-treatment or will install advanced air pollution control systems to reduce U-POPs release.
32. Without GEF support, this scenario would remain and Thailand will not be able to widely and successfully promote and introduce BAT/BEP measures in thermal processes in the metallurgical industry because of the limited local capacities and limited technical and financial resources.
33. Under the GEF alternative, Thailand would build the necessary capacity to accelerate its efforts to reduce U-POPs releases from facilities involved in secondary metals production and to meet its commitment with the obligations of the Stockholm Convention to protect human health and the environment from adverse effects of U-POPs.
34. In addition, the proposed project aims to implement activities to support an environmentally sound development of the scrap metal recycling industry in Thailand, focused not only on economic performance but also on social and environmental performances.

5) Global environmental benefits

35. The objectives and strategies of the project will assist in the reduction of UPOPs releases through the greening of the scrap metal value chain. It is clear that releases of U-POPs from poor technology practices will be completely eliminated only with the closure of existing, small facilities and the promotion of large, state-of-the art mills. In developing countries, small- and medium-size enterprises are widely distributed and employ several thousand workers and thus make a livelihood for several thousands of families. The implementation of the proposed project will help to mitigate U-POPs releases while keeping the employment opportunity unchanged.
36. The global environmental benefit expected from the implementation of the proposed project is the reduction of U-POPs releases from scrap metal recycling facilities. This reduction has been estimated at about 20 g TEQ/year of PCDD/Fs for the two demonstration facilities. The future reduction of PCDD/Fs emissions will be boosted by the nation-wide dissemination of BAT/BEP measures envisaged by the replication of the activities and results of the pilot project and by the enhancement of the policy and regulatory framework for a sound management of

metal recycling. In addition, the emissions of other U-POPs such as PCBs, HCB and PeCB will be also reduced, even if it is not possible to estimate this reduction.

37. Synergistic effect of energy efficiency and reduction of pollutant releases is also envisaged in the project. The reduction of U-POPs releases from the metal recycling chain also impacts on the reduction of other pollutants of local, regional and global significance, for instance particulate matter, VOCs, PAHs, heavy metals and mercury. This reduction is very important for the improvement of local air quality and for the improvement of the quality of life of present and future generations. Working conditions and worker's health and safety would be also positively impacted.
38. While the project aims at introducing BAT and BEP to reduce U-POPs releases from metal recycling facilities, it would also look at other cross-cutting benefits including minimization of resource use (energy, water, raw materials). Solid waste formation from the various processed used by the ferrous and non-ferrous metal industry may also be obtained with the BAT/BEP measures employed to reduce U-POPs releases. However, at this stage, initial quantification of these additional benefits is challenging. It is relatively easy to quantify the targeted reduction of dioxin release (the pilot facilities are supposed to be Class 1 and will be brought in Class 3 at the end of the project), the quantification of the other environmental benefits, however, presents difficult practical aspects related to the lack of actual data from the facilities (age of the facility, type of metal, scrap type, furnace technology, melting method, etc.) and the uncertainties on the actual BAT/BEP to be implemented in individual facilities. BAT/BEP measures to be implemented should be carefully evaluated on a plant-by-plant basis, and the additional environmental benefits, including the specific impacts on energy consumptions, can be assessed in each plant only through a holistic approach.
39. The implementation of BAT/BEP in the secondary metals industry has a very little or no negative effect on climate change if properly performed. For metal producers the relative weight of energy in their cost structure is a strong incentive to reduce energy consumption in the production processes. The promotion of BAT/BEP to reduce U-POPs releases from metal recycling facilities will allow the improvement of energy efficiency. The proposed project not only poses no climate change risks but present the added benefit of a reduction of the negative environmental impacts due to a reduced greenhouse gas (GHG) emissions.

6) Innovativeness, sustainability and potential for scaling up

40. The promotion of BAT/BEP in thermal processes in the metallurgical industry is relatively a new issue for Thailand. This would provide an opportunity to raise new professional figures and to create new employment opportunities. Moreover, it could provide the basis for the development of domestic research programs involving industry, academia and research institutions for the development of new technologies that could be used to prevent and reduce the releases of U-POPs and other pollutants of concern. This would contribute to the economic growth while supporting a sustainable development of the country.
41. DPIM under MOI has potential to sustain the project after 4 years of implementation because this project is in line with DPIM mandates which are (1) Implementation of the Minerals Act B.E. 2510, for example, Mining license, Mineral dressing and Metallurgical processing license, Mineral royalty, Purchase, sale and storage of minerals (2) Making policy for Primary Industry, Mining, and Industrial Logistics Management followed the national plan and industrial sector needs (3) Promotion and support for academic advice, research, and activities to development the Primary Industry, Mining, and Industrial Logistics.
42. Although the pilot project foresees the involvement of only two demonstration facilities where BAT/BEP will be implemented, this state-of-the-art technology can be scaled up by SME especially when the national policies and regulations are strengthened and provide possible regulatory mechanisms that maybe adopted to ensure sustainability of the proposed interventions. Most of SMEs in metals industry still do not aware about the U-POP emission problem because currently there is no rule and regulation to regulate them. The project envisages strengthening the regulatory framework relevant to this sector.

43. One of the main goals of the project is to improve and support the environmentally sound management of the recycling chain of pre-consumer and post-consumer scrap metal in Thailand. In the longer term, major changes are required to make consumption and production patterns more sustainable in a context of increasing growth. The sustainability of the project is ensured by supporting the baseline conditions and knowledge and assist people in doing things differently and changing their behaviour through the introduction of tools and technologies, processes, organizations and strategies. While the project primarily involves manufacturing industries and directs them towards environmentally-friendly practices while attempting to improve performance (i.e. lower costs, increases revenues, improved services, etc.). Beyond the technical side of change, this impacts on the management, processes and workflows of the enterprise and, ultimately, how individual employees do their work.
44. The project addresses one of the most important industry sectors and one of the most significant source categories of UPOPs. This project offers a unique opportunity to promote in Thailand, the sustainable use of resources by simultaneously coping with sustainable development goals and global environmental challenges. From a regional and global perspective, the successful implementation of this PIF will demonstrate the feasibility of setting up sustainable secondary metal production activities and to establish a system capable of reducing environmental impacts and health effects. The sustainability of the project is anchored on the perspectives of institutional strengthening and the active inclusion of the different stakeholders through dialogue and mediation. This would be a major achievement for Thailand, as part of its environmental commitment, with impacts at regional and global level.

2. *Stakeholders.* Will project design include the participation of relevant stakeholders from civil society and indigenous people? (yes /no) If yes, identify key stakeholders and briefly describe how they will be engaged in project design/preparation.

45. While the project envisages collaboration with civil society on its activities, the participation of indigenous people is not foreseen. The key stakeholders of the project shall include the following:

| Stakeholders | Role |
|---|--|
| Department of Primary Industries and Mines, Ministry of Industry | The Department of Primary Industries and Mines (DPIM) under the Ministry of Industry will be the partner agency for the project. Reduction of U-POPs emission from basic metal facilities is in line with DPIM's mandate. |
| Pollution Control Department (PCD), Ministry of Natural Resources and Environment | PCD sets and enforces environmental standards for all industrial sectors, including metallurgical. |
| Iron and Steel Institute of Thailand (ISIT) | ISIT is an independent body established by the Ministry of Industry. ISIT aims to develop Thai iron and steel industry to be internationally competitive and effectively drive the development of strategic industry. |
| Network of scrap collectors | The role of scrap collectors in the project is highly significant as this is the part of the value chain that processes the scraps from the generators. BAT/BEP measures would need to be implemented from this part of the chain. |
| Industry Associations, NGOs, academic and research institutions | The organizations will play a role in the dissemination of the project's activities and will be tapped for awareness-raising. |

3. *Gender Considerations.* Are gender considerations taken into account? (yes /no). If yes, briefly describe how gender considerations will be mainstreamed into project preparation, taken into account the differences, needs, roles and priorities of men and women.

46. Gender and Development (GAD) considerations will be made an integral part of the project strategy in consideration of the Gender policies of the GEF, UNIDO and the Government of Thailand. In addition, mandatory UNIDO gender markers will be applied, and that the project shall be rated for gender relevance. Gender marking entails inclusion in project reporting of the following data : (i) Total number of full-time project staff that are men/women; (ii) Number of men/women trained; (iii) Number of gender sensitive publications produced.

The secondary ferrous and non-ferrous metals industry has a high rate of women's participation in the labour force, although women and men are generally distributed differently across the different stages of the manufacturing process. Female workers represent a more vulnerable and high risk group to the problem posed by POPs because, unlike men, they are able to transfer their body burden to their offspring. The project will strive to ensure a reasonable balance of women and men involved in the project's management and in the decision-making structure and to ensure the participation of female community members in the awareness raising campaigns on the health and environmental impacts of U-POPs. The ultimate goal is to achieve a more positive impact on the social, environmental and economic aspects during the development of the project within a sustainable development framework.

4 *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).

47. The implementation of BAT/BEP in the secondary metals industry has very little or no negative effect on climate change if properly performed¹¹. For metal producers the relative weight of energy in their cost structure is a strong incentive to reduce energy consumption in the production processes. The implementation of state-of-the-art measures in the metal recycling industry allow the promotion of the improvement of energy efficiency in the sector. The proposed project not only poses no climate change risks but present the added benefit of a reduction of the negative environmental impacts due to a reduced greenhouse gas (GHG) emissions.

Particular risks that maybe encountered in the implementation of the project as well as the measures that maybe carried out to mitigate, if not eliminate them, are given in the following table:

| Risk | Risk level | Risk mitigation measure |
|---|------------|--|
| Low co-operation among scrap dealers, smelter facilities and other stakeholders. | M | All stakeholders will be fully involved since the initial stages of the project design process in order to identify all potential conflicting interest. |
| Failure in achieving a long-term reduction of U-POPs releases because of the difficulty to replicate and sustain the project results. | L | The strengthening of the policy and regulatory framework and the promulgation of national standards, coupled with the raised awareness and the capacity transferred to the enterprises through the training activities should provide the basis for the sustainability of the outputs of the project in the long term. |

5. *Coordination.* Outline the coordination with other relevant GEF-financed and other initiatives.

The project will build on the experience and achievements of the following projects to ensure that it is complimentary to each other.

48. The project will coordinate and cooperate with related GEF-funded projects and other initiatives on BAT/BEP. Complementarities on the efforts for the secondary metallurgical industry are envisaged through sharing of

¹¹ Report on benefits and trade-offs between energy conservation and releases of uPOPs. Technical report prepared on behalf of the Scientific and Technical Advisory Panel (STAP) of the Global Environment Facility (GEF), July 2009. 16

experiences and exchange of relevant information on BAT/BEP build in similar projects already ongoing or planned. Efforts for the implementation of BAT/BEP in the metallurgical industry was introduced in China and in Vietnam and therefore, the project will use the experience gained and capacities built by these GEF-funded UNIDO project. Close coordination and cooperation is targeted with the Regional BAT/BEP Forum for East and South East Asia (ESEA) and its ongoing activities such as the ongoing project on the introduction of BAT/BEP on fossil fuel-fired utilities and industrial boilers.

49. The project will fully benefit from UNIDO's experience and expertise in the implementation of BAT and BEP in industrial sectors. In UNIDO's current portfolio of POPs project, 28% focuses on the delivery of Article 5 obligations to the Stockholm Convention. UNIDO focuses on the Convention provisions that are directly related to the industrial sector, including wastes management streams, and provides technical assistance based on an environmentally sustainable industrial development approach. Such approach includes POPs pollution reduction and/or elimination, industrial process changes, substitute or modified materials and products, cleaner production methods, BAT and BEP, and the environmentally sound management for minimization and disposal of POPs chemicals and wastes.

6. *Consistency with National Priorities.* Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? (yes /no). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.

50. Thailand signed the Stockholm Convention on POPs since 22 May 2002 and ratified it on 31 January 2005. The National Implementation Plan (NIP) was developed to demonstrate how the obligations of the Convention will be implemented. The NIP was transmitted to the SC Secretariat on May 2007. The NIP provides policy and strategy frameworks as well as action plans and activities to meet objectives specific to Thailand. Pursuant to requirements related to measures to reduce releases of U-POPs as referred to in Article 5 of the Convention, Thailand has determined the following main activities:

- Update inventory data and projected releases for PCDDs/PCDFs emissions from all source categories;
- Update and revise existing legislation as well as establishing new legislation to include all potential source categories for PCDDs/PCDFs;
- Promote BAT for new sources as identified in Part II, Annex C after the 4-year period of entry into force, as determined in the Convention;
- Promote BEP for new and existing sources as identified in Part II and III of the Convention.

Specific priority objectives and activities are reported in the Action Plans on unintentional POPs, Chapter 3.6.3., pages 66-74 of the NIP. Promoting the application of BAT/BEP in industries which are potential sources of PCDD/PCDFs is reported as Goal 6.

51. The proposed project is fully consistent with the country's development strategies and with the environmental policies regarding the control and reduction of pollution and of hazardous chemicals set under the Enhancement and Conservation of National Environmental Quality Act B.E. 2535 (1992), The Eleventh National Economic and Social Development Plan 2012-2016, and Environmental Quality Management Plan 2012-2016. Through the reduction of U-POPs releases from thermal processes in the metallurgical industry, the project will assist the Government of Thailand to meet its priorities in promoting the sound management of chemicals throughout their life-cycle to reduce risks to human health and the environment. Moreover, the project will also promote the sustainable use of natural resources through the environmentally sound recovery and recycling of metal waste.

52. The proposed project will also greatly contribute to the commitment of the Government of Thailand to be a learning hub on environment-related topics as proposed by the Permanent Secretary Permanent Secretary of the Ministry of Natural Resources and Environment at the Second GMS Environment Ministers Meeting (EMM-2) held in Lao PDR. The meeting took stock of achievements of the GMS Core Environment Program (CEP) since its inception in April 2006 and discussed emerging environment, conservation and poverty reduction issues such as climate change, global warming and their effects on socio-economic growth and development. It is envisaged

that, once implemented successfully, the participating pilot facilities could provide learning and training on BAT/BEP technologies in the metallurgical sector.

7. *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.

53. Knowledge management will be based on an integrated approach for the identification, the evaluation and the diffusion of relevant information. The project will learn from generally available data and from completed and ongoing projects and initiative on the implementation of BAT/BEP for the reduction of U-POPs releases. Efforts for the implementation of BAT/BEP in the metallurgical industry was introduced in China and in Vietnam and therefore, the project will use the experience gained and capacities built by these GEF-funded UNIDO project.

During the implementation of the proposed project, several workshops will be held to disseminate technical concepts on BAT/BEP and to facilitate the exchange of ideas between people. Training materials will also be developed and disseminated. Information materials and articles will be published in professional and general public media, UNIDO and project websites and other relevant online platforms. Technical results will be presented in relevant conferences or scientific meetings.

New knowledge generated during the implementation of the project and lesson learned will be documented and disseminated through documents, national and international workshops and the developments of specific guidelines and manuals in order to share these information with relevant stakeholders.

Lessons learned in this project and achievements in the form of knowledge, skill and tools may be applied in similar developing countries in the fast growing Asian region to facilitate their own compliance with the Stockholm Convention and to enhance the local technological and institutional capabilities. The project could serve as a model for many developing and emerging countries experiencing rapid industrialisation and economic growth. However, there is a need to coordinate these efforts in order to make them more effective at a regional level

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

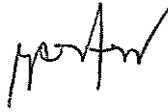
A. RECORD OF ENDORSEMENT¹² OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):

(Please attach the Operational Focal Point endorsement letter(s) with this template. For SGP, use this SGP OFP endorsement letter).

| NAME | POSITION | MINISTRY | DATE (MM/dd/yyyy) |
|------------------------------------|------------------------|---|-------------------|
| Mrs. Mingquan WICHAYARANGSARIDH | Permanent Secretary | MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT | |
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B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies¹³ and procedures and meets the GEF criteria for project identification and preparation under GEF-6.

| Agency Coordinator, Agency name | Signature | Date (MM/dd/yyyy) | Project Contact Person | Telephone | Email |
|--|---|----------------------|--|-------------------|-------------------------|
| Philippe R. Scholtès, Managing Director of Programme Development and Technical Cooperation Division UNIDO GEF Focal Point |  | 07/30/2015 | Carmela Centeno  | +43126026 3385 | c.centeno @unido.org |
| | | | | | |
| | | | | | |

C. ADDITIONAL GEF PROJECT AGENCY CERTIFICATION (APPLICABLE ONLY TO NEWLY ACCREDITED GEF PROJECT AGENCIES)

For newly accredited GEF Project Agencies, please download and fill up the required GEF Project Agency Certification of Ceiling Information Template to be attached as an annex to the PIF.

¹² For regional and/or global projects in which participating countries are identified, OFP endorsement letters from these countries are required even though there may not be a STAR allocation associated with the project.

¹³ GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, and SCCF

