# REQUEST FOR CEO APPROVAL

**PROJECT TYPE: Medium-sized Project**
**TYPE OF TRUST FUND:GEF Trust Fund**

For more information about GEF, visit TheGEF.org

## PART I: PROJECT INFORMATION

| Project Title: Greening Industry through Low Carbon Technology Applications for SMEs | | | |
|---|---|---|---|
| Country(ies): | Thailand | GEF Project ID:[1] | 5725 |
| GEF Agency(ies): | UNIDO | GEF Agency Project ID: | 130279 |
| Other Executing Partner(s): | Department of Industrial Promotion, Ministry of Industry | Submission Date:<br>Resubmission Date: | 2016-06-29<br>2016-08-05 |
| GEF Focal Area (s): | Climate Change | Project Duration(Months) | 42 |
| Name of Parent Program (if applicable):<br>➢ For SFM/REDD+ ☐<br>➢ For SGP ☐<br>➢ For PPP ☐ | | Project Agency Fee ($): | 178,600 |

### A. FOCAL AREA STRATEGY FRAMEWORK[2]

| Focal Area Objectives | Expected FA Outcomes | Expected FA Outputs | Trust Fund | Grant Amount ($) | Co-financing ($) |
|---|---|---|---|---|---|
| CCM-2 | Outcome 2.1: Appropriate policy, legal and regulatory frameworks adopted and enforced | Energy efficiency policy and regulation in place | GEF TF | 200,000 | 1,260,000 |
| | Outcome 2.3: GHG emissions avoided | Energy savings achieved | GEF TF | 1,680,000 | 8,250,000 |
| | | **Total project costs** | | 1,880,000 | 9,510,000 |

### B. PROJECT FRAMEWORK

| **Project Objective: To promote and support adoption of energy efficient practices and technologies in selected Small and Medium Enterprises (SMEs) in Thailand for improved competitiveness and a greening of industry** | | | | | | |
|---|---|---|---|---|---|---|
| **Project Component** | **Grant Type** | **Expected Outcomes** | **Expected Outputs** | **Trust Fund** | **Grant Amount ($)** | **Confirmed Co-financing ($)** |
| 1. Policy analysis and improvement for the promotion of low-carbon technologies within Thai SMEs. | TA | 1.1 Improved understanding and awareness of existing policy gaps and enabling policies support the improvement of the existing framework. | 1.1.1 Policy Gap and Barrier Analysis conducted, and key policy recommendations proposed to Thai policy-makers;<br><br>1.1.2 Awareness campaign promoting low-carbon technologies for | GEF TF | 200,000 | 1,260,000 |

[1] Project ID number will be assigned by GEFSEC.
[2] Refer to the Focal Area Results Framework and LDCF/SCCF Framework when completing Table A.

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | SMEs;<br><br>1.1.3 Financing schemes for the adoption of low-carbon technologies by SMEs facilitated. | | | |
| 2. Capacity building and implementation of low-carbon technologies in SMEs | TA | 2.1 Improved capacity and knowledge management supports the improvement of energy efficiency in SMEs; | 2.1.1 Technical capacity building on low-carbon technologies and Energy Management Systems (EnMS) for local technical experts, equipment and service providers, banking/financial institutions and industry;<br><br>2.1.2 An Online Information and Learning Platform (I&LP) on low-carbon technologies established and dissemination materials developed. | GEF TF | 682,000 | 800,000 |
| | INV | 2.2 Increased competitiveness of selected SMEs as a result of increased adoption of low-carbon technologies and improved operating practices. | 2.2.1 Implementation of low-carbon technologies and EnMS in SMEs; | | 784,000 | 6,810,000 |
| 3. Monitoring & Evaluation (M&E) | TA | 3.1 Effectiveness of the outputs assessed, corrective actions taken and experience documented | 3.1.1 Project and its activities monitored and evaluated on a regular basis in line with GEF, UNIDO, and government requirements;<br><br>3.1.2 Terminal Evaluation Report completed. | GEF TF | 50,000 | 200,000 |
| | | | Subtotal | | 1,716,000 | 9,070,000 |
| | | | Project Management Cost (PMC)[3] | GEF TF | 164,000 | 440,000 |
| | | | **Total project costs** | | 1,880,000 | 9,510,000 |

[3] PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

## C. SOURCES OF CONFIRMED CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME ($)

Please include letters confirming financing for the project with this form

| Sources of Co-financing | Name of Co-financier (source) | Type of Co-financing | Co-financing Amount ($) |
|---|---|---|---|
| GEF Agency | UNIDO | Grant | 60,000 |
| GEF Agency | UNIDO | In-Kind | 90,000 |
| National Government | Ministry of Industry | Cash/In-Kind | 2,000,000 |
| Private Sector | SME Bank | Loan | 7,360,000 |
| **Total Co-financing** | | | 9,510,000 |

## D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1]

| GEF Agency | Type of Trust Fund | Focal Area | Country Name/ Global | (in $) | | |
|---|---|---|---|---|---|---|
| | | | | Grant Amount (a) | Agency Fee (b)[2] | Total c=a+b |
| (select) | (select) | (select) | | | | 0 |
| **Total Grant Resources** | | | | 0 | 0 | 0 |

[1] In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.
[2] Indicate fees related to this project.

## E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

| Component | Grant Amount ($) | Co-financing ($) | Project Total ($) |
|---|---|---|---|
| International Consultants | 200,000 | 80,000 | 280,000 |
| National/Local Consultants | 350,000 | 400,000 | 750,000 |

## F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? No

(If non-grant instruments are used, provide in Annex D an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/NPIF Trust Fund).

## PART II: PROJECT JUSTIFICATION

### A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF[4]

Changes have been made to the overall project objective, as well as the project components, outcomes and outputs. The key national counterpart has changed from the Office of Small and Medium Enterprises Promotion (OSMEP) to the Department of Industrial Promotion (DIP) within the Ministry of Industry (MOI). As per discussions with DIP, the project has been re-focused on improving the awareness and adoption of low-carbon technologies in the SME industrial sector of Thailand via policy development, capacity building, knowledge management and support for the implementation of low-carbon technology investment projects for improved competitiveness and energy efficiency, as well as a reduced carbon footprint. The project duration has been extended from the initial 36 months to 42 months to reflect a more realistic implementation phase, taking into account procedures to be followed at project start-up. The detailed changes made are outlined in the table below.

| **Components and outputs at PIF stage** | | **Components and outputs at CEO endorsement stage** | |
|---|---|---|---|
| **Project Component** | **Expected Outputs** | **Project Component** | **Expected Outputs** |
| 1. Development and enforcement of policy measures and streamlining of incentive schemes | 1.1 Approved national policy in place<br><br>1.2 Existing incentive schemes for promoting RETs under various ongoing projects and programmes will be streamlined for supporting technologies for thermal energy generation in SMEs | 1. Policy analysis and improvement for the promotion of low-carbon technologies within Thai SMEs | 1.1.1 Policy Gap and Barrier Analysis conducted, and key policy recommendations proposed to Thai policy-makers;<br><br>1.1.2 Awareness campaign promoting low-carbon technologies for SMEs;<br><br>1.1.3 Financing schemes for the adoption of low-carbon technologies implementation by SMEs facilitated and promoted. |
| 2. Development of human and institutional capacity | 2.1 An information and learning center (I&LC) on RETs for SMEs established<br><br>2.2 Technical capacity of OSMEP, ISMED, SMEs and local technical experts developed<br><br>2.3 Database of GHG emissions from the participating SMEs developed and publicly accessible | 2. Capacity building and implementation of low-carbon technologies in SMEs | 2.1.1 Technical capacity building on low-carbon technologies and EnMS of local technical experts, equipment and service providers, banking/financial institutions and industry;<br><br>2.1.2 An Online Information and Learning Platform (I&LP) on low-carbon technologies established and dissemination materials developed;<br><br>2.2.1 Implementation of low-carbon technologies and EnMS in SMEs; |
| 3. Promotion of RETs for heat generation in SMEs | 3.1 Installation of RETs for heat generation in 3 factories leading to 20% replacement of their fossil fuel consumption | | The implementation activities of the project have been incorporated into Component 2. |

[4] For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter "NA" after the respective question.

| Components and outputs at PIF stage | | Components and outputs at CEO endorsement stage | |
|---|---|---|---|
| **Project Component** | **Expected Outputs** | **Project Component** | **Expected Outputs** |
| 4.1 Monitoring and evaluation (M&E) | 4.1 Mid-term M&E report<br><br>4.2 End of project M&E report<br><br>4.3 Experiences and information dissemination workshops<br><br>4.4 Publications and websites | 3. Monitoring & Evaluation (M&E) | 3.1.1 Project and its activities monitored and evaluated on a regular basis in line with GEF, UNIDO, and government requirements;<br><br>3.1.2 Terminal Evaluation Report completed; |

**A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.**

The proposed project is in line with the major national policies and programmes on energy efficiency, sustainable technologies, and SME development in Thailand. Specifically, the project will actively contribute to the below listed policies through its policy, capacity and implementation focused activities.

*Thailand's National Capacity Self-Assessment (NCSA) to the UNFCCC (2010)*: Based on national priorities for addressing climate change and environmental issues, the NCSA identified the following capacity needs in Thailand: a) greater coordination and communication; b) greater political will and high level support from industries; c) establishment of institutional arrangements for maintaining the continuity of climate change implementation strategies, projects and programmes; d) increased scientific knowledge through specialized training and education; and e) increase communications with stakeholders through enhanced outreach strategies.

*Second National Communication to UNFCCC (2011)*: Describing Thailand's inventory status from 2000-2004, the communication recognizes that energy remains the key source of GHG emissions. In 2000, Thailand emitted 210.23 million tons of $CO_2$ and absorbed 52.37 million tons of $CO_2$, resulting in net $CO_2$ emission of 157.86 million tons. The power generation by the energy sector was the largest emitter of $CO_2$ (64.2 million tons), followed by transportation at 44.4 million tons, and industry at 30.3 million tons. The communication identified techniques, know-how and technologies needed to mitigate GHGs which include: a) analytical techniques to prioritize mitigation options for energy conservation and renewable energy; b) advanced technologies for energy conservation for electricity production and consumption; c) efficient technologies and systems for traffic and mass transport, especially for logistics; d) technologies for biomass and biogas energy production appropriate for local conditions; e) environment-friendly technologies for cement production; f) development of knowledge and infrastructure for innovation of clean technologies; and g) technologies to mitigate GHG from rice paddy fields.

*National Portfolio Formulation Document (NPFD) under GEF-5* concluded that one of the key challenges faced by Thailand is the enhancement of national GHG mitigation strategies and the maintenance of a national sustainable development path. It suggested the integration of various environmentally sound technologies to enhance energy conservation and energy efficiency. Thailand gives high priorities in the areas of enhancement of green economy, increase of energy efficiency and use of renewable energy, carbon sink enhancement and synergy among climate change, biodiversity and land degradation.

*Technology Needs Assessment (TNA) and Technology Action Plan (TAP) Report, TNA (2012):* The results of the technology prioritization are summarized as follows: a) Smart grid, b) Waste (to power generation), c) Second and third generation of biofuels, d) Energy efficiency in combustion in the industrial sector and e) Carbon capture and storage (CCS). It also concluded that Thailand needs international support on technology knowledge transfer. It also suggested linking with international organizations and experts to ensure the proper application of the state of the art technologies.

*The National Industrial Development Master Plan (2012 – 2031) by the Ministry of Industry (MOI)* specifies 3 strategies to strengthen Thai industries, i.e. a) internationalized industrial structure and clusters to capture global opportunities; b) upgrade and creation of sustainable entrepreneurship; and c) enhance competitiveness of the industry platform. The first phase of the plan covered 5 years, which prepared Thailand for the ASEAN Economic Community (AEC) by changing relevant regulations to facilitate development in basic structure, developing industrial clusters, and implementing environmental friendly manufacturing with the aim of becoming ASEAN Supply Chain. The next 5 years of the plan will emphasize knowledge-based development in order to support manufacturing sectors and products that require technologies and innovation. Thailand aspires to become the regional center for logistics and having Thai brands earn recognition and acceptance by consumers in the region. During the final phase of the plan, which covers the last 10 years, not only brands from Thailand will be recognized globally, but also balances among economic, social environment, and human resources will be created in the manufacturing sectors. To achieve the above goals, some industrial sectors were identified as crucial for Thailand's development and accordingly SME clusters will be created to strengthen the competitiveness in order to capture global opportunities. The identified sectors were food, automotive and supply chain, rubber, electronics and appliances, textile, jewelry, mold and renewable/alternative energy. The four first sectors are directly targeted by this project.

*The 3rd SME Promotion Master Plan 2012- 2016* consists of four strategies, i.e., supporting the business environment of SMEs, supporting SMEs' abilities to compete, supporting sustainable growth, and supporting SMEs to participate in international trade. Under this plan, the Thai Government will seek to support SMEs in conducting environmental friendly practices and to improve effectiveness in business processes, including manufacturing process.

*The 11th National Economic and Social Development Plan (2012-2016)* emphasizes a restructuring of the country's production and consumption behavior in order to prepare for a transition towards a low-carbon and environmentally friendly economy. The plan recognizes that efficiency of production and services need to be enhanced in order to achieve food and energy security and, the agricultural base and SMEs will play key roles in the development process towards a stable and sustainable future.

*The Draft 12th National Economic and Social Development Plan (2017 – 2021)* sets several targets, including the creation of an environmentally friendly economy and society. In order to achieve the target, the plan will develop clusters of green industries and support manufacturers to improve their systems towards the development of green supply chain/green value chain.

*Thailand Integrated Energy Blueprint, TIEB (2016 – 2036)* was approved by the National Energy Policy Committee in December 2015. The blueprint integrates 5 important plans under one umbrella, namely: the Power Development Plan (electricity demand & supply), Gas Plan (natural gas management), Oil Plan (liquid fuel management), Alternative Energy Development Plan (alternative energy development), and Energy Efficiency Plan (energy efficiency improvement). The objectives of TIEB are (1) supply security, (2) cost competitiveness, (3) environment, (4) energy support sustainability, and (5) socio-economic support for the needed people/sector.

*The Energy Efficiency Development Plan, EEDP (2015 – 2036)* aims to reduce Thailand's energy intensity by 30% (with a base year of 2010) with the reduction in energy consumption compared to the BAU scenario increasing every year and reaching a maximum of 56,142 ktoe in the year 2036. The plan consists of 7 strategies: (1) Energy Management Systems implementation by designated factories and buildings; (2) Establishment of Building Energy Codes (BEC); (3) Establishment of Energy Efficiency Labelling Programmes (HEPS and MEPS); (4) Establishment of Energy Efficiency Resources Standards (EERS); (5) Financial support for energy efficiency improvements; (6) Programmes to support using LED lighting; and (7) Energy conservation in the transport sector.

*The Environmental Management Plan, EMP (2012-2016)* has six key priorities under the umbrella objective of the "Promotion of low carbon manufacturing and sustainable consumption and climate change," which aims to reform the manufacturing process and consumption behavior to low carbon basis. The action plan includes: a) promoting sustainable consumption; b) low carbon manufacturing; c) low carbon development of basic infrastructure; d) sustainable renewable energy management; e) low carbon agriculture; and f) sustainable tourism.

**A.2. <u>GEF</u> focal area and/or fund(s) strategies, eligibility criteria and priorities.**

The GEF-5 Climate Change Focal Area Objective 2 aims at promoting market transformation for energy efficiency in industry and the building sector. This project contributes to this objective through its development of improved policy

and regulatory frameworks; institutional capacity building for SMEs, and the implementation of low-carbon technologies, including energy efficient technologies.

**A.3 The GEF Agency's comparative advantage:**

Following the endorsement of the Lima Declaration in December 2013, UNIDO has a mandate to promote inclusive and sustainable industrial development (ISID). Recognizing that future strategies for poverty reduction need to be economically empowered, UNIDO promotes ISID to harness the full potential of industry's contribution to the achievement of sustainable development, and lasting prosperity for all. UNIDO has been recognized by the Global Environment Facility (GEF) as having comparative advantage in the development and implementation of Industrial Energy Efficiency (IEE) projects and with its mandate to promote ISID, UNIDO has positioned itself as one of the most relevant players to assist industries of both developing countries and economies in transition. UNIDO has long-standing sector-wide experience with the technical, policy and financing aspects of efficiency improvements in manufacturing and process industries, and has implemented EE-focused projects in about 25 countries around the world. In South-East Asia, such projects are being implemented in Thailand, Malaysia, Myanmar, Indonesia, the Philippines and Vietnam. In addition, UNIDO has been implementing SME-focused EE projects in India since 2012, and has recently developed a similar project in Indonesia.

UNIDO has extensive experience in cooperating with different Thai government agencies in the development of policies and institutional frameworks to support industrial development. Over time, UNIDO has also developed strong partnerships with various industrial and enterprise associations in Thailand, which will facilitate the successful implementation of the project. Currently, UNIDO is implementing a number of projects in Thailand, with further projects under development. The following ongoing projects demonstrate UNIDO's vast experience in the implementation of energy-related projects in Thailand:

1. CF: Industrial Energy Efficiency (GEF ID 2786)
2. Promoting Small Biomass Power Plants in Rural Thailand for Sustainable Renewable Energy Management and Community Involvement (GEF ID 4037)
3. Demonstration of BAT and BEP in Fossil Fuel-fired Utility and Industrial Boilers in Response to the Stockholm Convention on POPs (GEF 3732)
4. Overcoming Policy, Market and Technological Barriers to Support Technological Innovation and South-South Technology Transfer: The Pilot Case of Ethanol Production from Cassava (GEF ID 4037)

The proposed project is in alignment with the recently approved UNPAF 2012 – 2016 (the United Nations Partnership Framework, Thailand 2012-2016) and UNIDO is also part of the UN country team which is responsible for implementing the UNPAF. The UNPAF has six priority areas: social protection; human rights and access to justice; strategic information; climate change; international cooperation; and creative economy. This project contributes to one of the expected outcomes under the joint partnership on Climate Change*: Energy, industry and transport sector progressively contribute to the development of a low-carbon and green economy.*

This outcome emphasizes the management of natural resources and an environment towards sustainability, as one of the key development strategies agreed upon the Royal Thai Government (11$^{th}$ National Economic and Social Development Plan). UNPAF shows its commitment to UN agencies in Thailand supporting the country in responding to the challenges of climate change without hampering its economic development by setting up the United Nations Joint Team (UNJT) on Climate Change (CC).

**A.4. The baseline project and the problem that it seeks to address:**

Thailand is host to approximately 2.6 million Small and Medium-sized Enterprises (SMEs), which account for more than 36% of Thailand's GDP and 83.89% of the national workforce[5]. The number of SMEs is projected to grow annually by 10% in Thailand.[6] Within the industrial sectors to be focused on by this proposed project, small enterprises dominate the sectors and therefore, have a significant impact on both economic factors, as well as environmental.

[5] White Paper on Small and Medium Enterprises of Thailand in 2011, Trend of 2012
[6] Accelerating Energy Efficiency in Small and Medium-sized Enterprises, OECD/IEA, 2015

The following table (Table 1) provides an overview of the number of SMEs in selected industrial sectors:

**Table 1: Number of SMEs in targeted industrial sectors**

| Sector | Number | | |
|---|---|---|---|
| | Small | Medium | Total |
| **Food and Beverage Industry*** | | | |
| Food sector | 15,096 | 568 | 15,664 |
| Beverage sector | 4,346 | 28 | 4,374 |
| **Automotive Supply Chain Industry*** | | | |
| Rubber and plastic sector | 5,003 | 480 | 5,483 |
| Electrical equipment sector | 2,078 | 127 | 2,205 |
| Computer and electronic equipment sector | 1,739 | 114 | 1,853 |
| **Ceramics Industry*** | | | |
| Ceramics sector | 2,964 | 146 | 3,110 |
| **Total** | 31,226 | 1,463 | 32,689 |

**Source:** www.sme.go.th

* The project directly targets these industrial sectors (see reference under section A.5, Output 2.2.1).

According to the Institute for Small and Medium Enterprises Development (ISMED)'s primary survey and analysis of SMEs in Thailand, the majority of SMEs spend around 16-25% of their total production cost on energy requirements alone (around 90% attributed to heat generation and 10% to electricity). A report of the Department of Alternative Energy Development and Efficiency (DEDE) showed that when specific energy consumption of SMEs was compared with larger industries producing similar products, SMEs in general had higher specific energy consumption than the larger industries, indicating that their production cost is higher as well. It was further found that manufacturing SMEs contributed around 15.9 million $tCO_2e$ emissions every year (nearly 33.7% of total industrial sector emission). During the PPG stage, UNIDO made efforts to gather specific data on the energy consumption of SMEs in Thailand from DEDE; however, this was not possible as such a database does not yet exist in DEDE (planned by late-2016). DEDE does, however, have information on some SMEs in Thailand, which was used to make comparative analysis of energy consumption (Table 2 shows energy consumption in terms of fuel by industrial sectors).

**Table 2: Energy consumption in terms of fuel by industrial sectors (2014)**

| Type of Industry | Type of energy used in the industry (ktoe) | | | | | | |
|---|---|---|---|---|---|---|---|
| | NG | Fuel oil | Coal | LPG | Diesel | Electricity | Renewable |
| Food and drink industry | 110 | 274 | 225 | 35 | 1,261 | 1,191 | 7,631 |
| Paper Industry | 764 | 42 | 153 | 6 | 175 | 205 | 370 |
| Textile Industry | 26 | 33 | 20 | 16 | 142 | 590 | 6 |
| Non-ferrous industry | 757 | 44 | 3,940 | 68 | 307 | 577 | 481 |
| Chemical industry | 570 | 84 | 177 | 212 | 304 | 929 | 237 |

**Note:** The table does not make a distinction between the data collected from SMEs or from the industrial sector in general

An ISMED survey also identified the primary carbon reduction opportunities in SMEs which included: i) reduction of energy losses in the production process; and ii) use of solar hot water and biomass boiler technologies for process heat generation.

An additional study conducted by DEDE has analyzed energy intensity by Thai manufacturing sub-sectors, the findings of which are listed below:

**Table 3: Energy intensity in Thai manufacturing sub-sectors**

| Sector | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| Food and beverage | 17.26 | 16.31 | 16.27 | 17.41 | 17.30 |
| Textiles | 3.38 | 2.87 | 3.05 | 3.75 | 3.94 |
| Wood and furniture | 9.09 | 9.08 | 9.25 | 11.80 | 11.68 |
| Paper | 23.66 | 20.56 | 21.31 | 23.74 | 26.37 |
| Chemical | 5.49 | 5.29 | 5.27 | 5.86 | 6.36 |
| Non-metallic | 75.17 | 74.25 | 66.90 | 61.64 | 53.14 |
| Basic metal | 22.89 | 31.16 | 36.15 | 30.86 | 30.20 |
| Fabricated metal | 1.45 | 1.45 | 1.68 | 1.67 | 1.80 |
| Others | 15.45 | 18.11 | 15.58 | 15.46 | 17.83 |

**Unit:** ktoe/billion Baht

**Source**: Thailand Energy Efficiency Situation by Department of Alternative Energy Development and Efficiency

**Note:** The table does not make a distinction between the data collected from SMEs or from the industrial sector in general

Baseline Policies and Initiatives

In order to encourage efficiency and sustainability of the project interventions, the proposed project will build upon the existing national initiatives focused on energy efficiency, low-carbon technologies and SME development. The specific projects that form the baseline in Thailand are listed below:

*Total Energy Management project:* The Department of Industrial Promotion (DIP) under the Ministry of Industry (MOI) implemented during 2004-2015 the Total Energy Management (TEM) project targeting SMEs. The TEM project's main aim was to raise awareness among factory management and personnel and support energy efficiency assessment and implementation in SMEs. In total 969 SMEs participated in the project, resulting in average savings of 9.76%. However, most of the factories participating in the TEM project were medium-sized factories. Having more than 10 years' experience in working on the TEM project, DIP recognizes that limited resources, including human resources with technical and financial capacity, as well as data availability, are among the major constraints for SMEs to implement energy efficiency projects.

The summary of the TEM project implementation is shown below:

**Table 4: Summary of TEM project implementation**

| Year | | No. of Enterprises | Energy Savings (Baht) | % of Energy Savings |
|---|---|---|---|---|
| 2004 | (TEM1) | 49 | 157,079,124 | 12.37 |
| 2005 | (TEM2) | 40 | 111,183,840 | 8.96 |
| 2006 | (TEM3) | 45 | 117,603,350 | 14.07 |
| 2007 | (TEM4) | 55 | 248,630,389 | 10.12 |
| 2008 | (TEM5) | 100 | 219,488,073 | 7.29 |
| | (TEM6) | 25 | 54,383,662 | 10.23 |
| 2009 | (TEM7) | 120 | 149,043,614 | 12.07 |

| Year | | No. of Enterprises | Energy Savings (Baht) | % of Energy Savings |
|---|---|---|---|---|
| 2010 | (TEM8) | 100 | 115,031,714 | 9.54 |
| 2011 | (TEM9) | 100 | 239,218,450 | 11.10 |
| 2012 | (TEM10) | 100 | 303,512,829 | 5.66 |
| 2013 | (TEM11) | 100 | 672,248,342 | 5.36 |
| 2014 | (TEM12) | 70 | 148,552,000 | 10.07 |
| 2015 | (TEM13) | 65 | 140,000,000 | 10 |

*Green Industry Initiative:* The Thai Government introduced the Green Industry Initiative *(*GII) in 2011, which aims to achieve sustainable growth of the industrial sector in accordance with ecology and social well-being[7]. Although the Green Industry Promotion and Development Office (GIPO) under the MOI were directly responsible for this initiative, it has been dissolved and GII is now under the Bureau of Policy and Strategy, Permanent Secretary Office of the Ministry of Industry. GII aims to encourage manufacturing enterprises to continuously improve their climate friendly production processes and environmental management. MOI aims to get 70,000 enterprises certified as Green Industries by 2018; as of January 2013, around 2,675 organizations[8] has been certified under the GII programme. As part of the programme, industries can implement renewable energy (RE) and energy efficiency (EE) measures to leverage on their competence as green industry and go up a level. Some of the incentives offered to industries, depending upon their compliance levels, are:[9]

- Exemption of annual factory license fee for 5 years
- Investment promotion
- Machine import duty exemption
- Corporate income tax exemption for 8 years
- Income tax exemption

Although such incentives are available, the desired impact has not yet been felt in the sector and the potential is being under-utilized. The proposed project, through its awareness raising activities and knowledge platform, will aim to support the increased use and implementation of the GII.

*Thailand Integrated Energy Blueprint:* The National Energy Policy Committee approved the Thailand Integrated Energy Blueprint (TIEB) at the end of 2015. The Blueprint brings 5 energy plans under one umbrella, one of which is the 20-year Energy Efficiency Development Plan (EEDP) (2015-2036) with an average annual budget of 5.6 billion Baht (USD 159 million) to support various projects, including financial support to SMEs, a revolving fund for implementing energy saving measures, performance-based incentive programmes, etc. Key incentives relevant to the proposed project are listed below:

- *Demand Side Management through a Bidding Mechanism (DSM Bidding).* Proposals to change to energy-efficient equipment and machinery will be solicited from industries and incentives will be based on actual energy savings. The programme will have a total budget of 21 billion Baht (USD 596 million) for 22 years.
- *Soft Loan for Energy Conservation.* Banks will offer low interest loans to customers who are interested in installing energy-efficient equipment and machinery. The budget will be 15 billion Baht (USD 426 million) for 22 years.

[7] This initiative rewards environmental friendly firms by certifying them with 5 levels of green industry as follows: Level 1 - Green commitment; Level 2 – Green Activity; Level 3 – Green System; Level 4 – Green Culture; Level 5 – Green Network (Green Supply Chain). For further details please refer to http://www.greenindustrythailand.com/en/content.php?pagename=condition

[8] http://www.greenindustrythailand.com/en/content.php?pagename=factory_map

[9] Thailand: Green Economy: The 7th Seoul Initiative Leadership Programme on Green Growth: The dividend between "Green" and "Economy", October 16 - 26, 2012, The Office of Industrial Economics (OIE), Ministry of Industry (MOI)

- *The Energy Service Company (ESCO) revolving fund,* with total budget of 7.8 billion Baht (USD 221 million) for 22 years, has been earmarked for encouraging private investments in EE projects. This will benefit the projects in the following ways: a) Equity investment (10 to 50%); b) Venture capital; c) equipment leasing; d) Facilitation of project design document (PDD) development under the Clean Development Mechanism of UNFCCC; f) credit guarantee facility; and g) technical assistance (energy audits, feasibility studies, limited to 100,000 Baht (USD 2,800) per project).

However, the above initiatives are almost entirely geared towards larger industrial actors. There are only two programmes specifically geared towards SME's as follows:

- *Tax incentive scheme for switching to energy-efficient equipment/machinery and promote EE investment.* Total budget of 21 billion Baht (USD 596 million) for 22 years to encourage the replacement of old and inefficient equipment and machinery with efficient alternatives, as well as encourage investment in EE/RE projects.
- *Standard Offering Programme (SOP).* This is similar to the DSM Bidding project above but a) targets only SMEs and b) no proposal submission is required. Several standard energy efficiency improvement measures, that are suitable for SMEs, will be announced with subsidy rate for each unit of saved energy. The programme will have a total budget of 21 billion Baht (USD 596 million) for 22 years.

These programmes, while geared towards SMEs, require significant assistance to ensure there is enough uptake and demand from SMEs.

<u>International Initiatives:</u>

The *Thailand Sustainable Energy Finance Programme* was launched in 2009 with a budget of around USD 30 Million by the International Finance Corporation (IFC), World Bank under their Clean Technology Fund. The programme aims to help Thailand address its climate change challenges by making a major contribution in three critical areas: a) Increasing private sector involvement in the development and financing of EE/RE/energy service company (ESCO) investments; b) Supporting clean and green technologies' market transformation by developing EE/RE/ESCO investments and providing new clean energy technologies and energy efficient equipment in Thailand's large corporate, SME, commercial, residential and municipal sectors; and c) Enhancing resource savings by raising market awareness of benefits associated with new clean and green technologies.

The project *Improving the Energy Efficiency of Small and Medium-sized Enterprises* was implemented in 2009-2012 by the German Agency for International Corporation (GIZ) in partnership with the Department of Industrial Works (DIW) and the Federation of Thai Industries (FTI). The €1.3 million project was aimed at building the capacity of advisory services and funding instruments to increase energy efficiency, which included a) analyzing energy-related advisory services already available to SMEs to determine the need for initial and further training for energy efficiency advisors; b) conducting baseline studies and drawing up guidelines on best available techniques (BATs) for a five energy-intensive industrial sectors (glass industry, ferrous metal and aluminum foundries, textile industry and food industry); c) developing curricula and training material on and carrying out stakeholder and expert workshops on energy efficiency, environmental performance and safety standards; d) creating a Thai energy efficiency network for SMEs; e) conducting energy audits in identified pilot plants in each sector. In the 23 companies participating, energy consumption was reduced by 4.27 percent on average.

The *Thai-German Programme on Energy Efficiency Development Plan* (TGP-EEDP) ran between 2012 and 2015. The plan was commissioned as part of the International Climate Initiative (IKI) of the German Federal Environment and Building Ministry. The objective was to support implementation of the 20-year Energy Efficiency Development Plan (EEDP) (2011–2030) that promotes energy efficiency in industry and the building sector. Several instruments were developed and incorporated as part of EEDP including the Standard Offer Programme, a subsidy programme based on energy savings achieved, and Energy Efficiency Resource Standards, which is an energy saving obligation for utilities. The programme also linked the EEDP with climate policy by identifying NAMAs (nationally appropriate mitigation actions) based on energy efficiency policies. The development of a NAMA on energy efficiency has resulted in closer cooperation between the Ministry of Environment and the Ministry of Energy, which has raised awareness in both ministries regarding their respective objectives, and of the synergies they can achieve through collaboration. In particular, the two ministries have come to view MRV (measuring, reporting and verification) as essential to the

successful implementation of the NAMA. It was therefore incorporated into the first training on energy efficiency policy impact assessments, which was attended by both ministries.

*Greening Supply Chains in the Thai Auto and Automotive Parts Industries (SMEs) funded by EU SWITCH ASIA and the German Agency for International Corporation, GIZ*[10] The overall objective is to improve sustainable production of SMEs in the Thai auto and automotive parts supply chains. The objectives of the project include the following:

- To improve productivity and environmental performance of Thai auto and automotive parts production;
- To enhance networks, business and financial services for greening of the Thai auto and automotive parts industry;
- To disseminate good practices and promote the development and implementation of related policy and economic instruments.

While a number of initiatives to promote energy efficiency and foster the adoption of efficient technologies in SMEs exist in Thailand, a lack of awareness and capacity prevents the initiatives from having wide-reaching and sustainable impact in the country (these barriers are elaborated on below). The proposed project will aim to tackle this issue; providing SMEs and technical experts with the awareness and capacity required to implement EnMS and low-carbon technology projects utilizing existing incentive schemes and policies, and support the government on the policy aspects to ensure an ongoing supportive policy environment.

Barriers to Energy Efficiency Improvements in SMEs:

Industrial enterprises, particularly SMEs, have generally failed to implement EnMS and low-carbon technologies despite the large potential for improvements and several initiatives launched by the government. This is due to a number of persistent barriers in the market that contribute to the limited uptake of energy efficiency measures in SMEs.

***Informational barriers*** contribute significantly to the widespread failure to recognize the present opportunities in energy efficiency; there is a lack of information on available options and incentives, best practices, and benchmarks. In addition, while there are a number of government initiatives and incentives to promote energy efficiency, SMEs are generally unaware of these or do not understand the specific criteria to access the support mechanisms. To overcome this barrier, the proposed project will organize a number of awareness raising workshops for industry, as well as establish an Information and Learning Platform to provide the relevant information to SMEs in a user-friendly and one-stop-shop manner.

***Technical barriers:*** The absence of technical expertise within SMEs constitutes a major barrier to the improvement of low-carbon technologies and EnMS adoption in facilities. Given that such technologies and approaches are relatively new to the Thai market, in particular to SMEs that tend to use outdated and inefficient technologies, awareness and understanding of the benefits associated with such improvements is also lacking. In addition, high turnover of the plant personnel assigned to the operation of industrial systems and changes in production tend to lead to a lack of persistence and a short term approach to facility improvements and energy management. SMEs also lack the technical information and training to support decisions to pursue improvements in their energy-consuming equipment/systems. The awareness raising and capacity building outputs of the proposed project will aim to overcome these barriers, working closely with industry to familiarize them with the technologies/systems and increase their acceptance and adoption of them.

***Market barriers:*** Most industries, and in particular SMEs, have a budgetary disconnect between capital projects and operating expenses; life cycle assessments of purchases are rarely considered in industrial projects, with initial cost, rather than long-term savings being the key determinate of purchase decisions. Further, local service and equipment providers also lack the knowledge and skills to properly market more efficient technologies and energy management systems to industry, and therefore are unable to convey the long-term benefits associated with the alternative equipment and operating procedures.

***Financial barriers:*** As mentioned earlier, the existing support schemes for energy efficiency improvements provided by the government are underutilized by SMEs, primarily as a result of limited awareness or understanding. As a result, when external financing is required, SMEs tend to approach conventional forms of financing from banks, where loan

[10] http://archive.switch-asia.eu/index.php?eID=tx_nawsecuredl&u=0&file=/uploads/tx_dbsaprojects/Information_Green_Auto_Parts_02.pdf&t=1397115597&hash=42ff2bfceefc0a008c159e983960983e0a1e9704

officers lack an in-depth understanding of energy efficiency projects and their ability to achieve significant cost savings in the medium and long-term. At the banking level, there are three key issues: (i) lack of understanding of the particular needs of projects and how to properly evaluate them; (ii) disconnect between the available financing products and the individual particulars of low-carbon technology projects; and (iii) perspective that low-carbon technology projects are high risk, and thus, collateral are a requirement to reduce this risk. The proposed project will aim to overcome this barrier through the facilitation and promotion of financing schemes focused on low-carbon technologies in SMEs by increasing awareness and understanding through the development and dissemination of a user-friendly package for SMEs on available and relevant financing schemes.

***Policy barriers:*** There are many policy and regulatory measures implemented by the Government of Thailand to promote low-carbon technologies and especially, energy conservation in the country. These initiatives have so far produced good results in large enterprises, but have had very limited achievements in SMEs, for reasons highlighted above. The lack of awareness by SMEs is compounded by a large number of institutional players in the areas of energy, environment and industry in Thailand, which often causes overlap and lacking coordination in the Thai policy environment. This issue also complicates the process of developing and improving policies; for this reason, the proposed project's Project Steering Committee will be a key tool for the policy activities, and will facilitate cooperation and communication between the relevant parties.

**A.5. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:**

Business As Usual Scenario

In the business-as-usual scenario, the adoption of low-carbon technologies and EnMS by SMEs in Thailand would be limited due to the existing and persistent barriers in the Thai market (see above). The lacking supportive environment for SMEs would persist, while lack of capacity within SMEs and government and financial institutions would continue to limit investment in low-carbon technologies and the adoption of EnMS. As a result, the majority of SMEs would be held back by lower levels of productivity and poor quality products, combined with a general lack of commitment due to limited utilization of incentives and awareness.

Project Alternative:

It can be assumed that ongoing national and multilateral projects in Thailand would have an incremental impact on GHG emissions and productivity. The project, with a relatively small GEF Grant, will aim to catalyze investment in low-carbon technologies at the SME level of Thailand, thus having a large replication potential beyond the project implementation period and scope. Specifically, the GEF grant will be utilized to develop an environment conducive to increased investment in low-carbon technologies and energy efficiency improvements by SMEs; namely through policy support to government agencies, comprehensive capacity building and knowledge sharing on the technical and financial aspects of energy efficiency projects, and technical and financial support for implementation projects. The co-financing contributions of the project partners will support these efforts through funding support, technical assistance and policy and regulatory support for upscaling and replication. In the absence of the proposed project, the capacity for realizing the Thai Government's strategy for SME development towards achieving higher competitiveness in the global market through low-carbon technology measures will remain limited.

The proposed project will be designed around two substantive components in order to achieve its goals and overcome the barriers currently hindering the promotion and adoption of low-carbon technologies and EnMS among Thai SMEs. These components directly support the GEF-5 Climate Change Strategy 2, namely to promote market transformation for energy efficiency in industry and the building sector. In order to achieve this, the proposed project will aim to create demand for low-carbon technologies through awareness raising activities, capacity building of government, financial institutions, industries, and technical personnel, as well as the implementation of demonstration projects to encourage the adoption of such technologies in SMEs.

***Component 1: Policy analysis and improvement for the promotion of low-carbon technologies within Thai SMEs***

**Outcome 1.1 Improved understanding and awareness of existing policy gaps and enabling policies support the improvement of existing policy framework.**

Component 1 of the project will focus on improving the policy and regulatory framework to promote the adoption of low-carbon technologies by SMEs for improved competitiveness and reduced energy consumption. This approach will aim to identify and address the barriers related to the policy and institutional frameworks, as well as provide policy-makers with the knowledge and tools required to develop enabling policies for Thai SMEs, particularly in the field of clean technology adoption. In addition, awareness campaigns and improved information dissemination of the benefits associated with the adoption of low-carbon technologies and relevant financing schemes will help bridge informational barriers and lay the groundwork for the activities to be completed under Component 2.

*Output 1.1.1 - Policy Gap and Barrier Analysis conducted, and key policy recommendations proposed to Thai policy-makers*

In order to help improve the policy environment for SMEs in Thailand in the field of energy-related improvements, as well as enhance coordination between the relevant policy-making institutions, the project will review the various policies and regulations that focus on SMEs and the promotion of low-carbon technologies in Thailand, and produce a comprehensive gap and barrier analysis, along with recommendations for adoption by Thai policy-makers. This will be a resource not only for policy-makers, but also support SMEs who may have limited knowledge of the support networks available to them, thus helping to overcome the existing informational barriers within SMEs.

In particular, the Policy Review will focus on and support the following key action plans of the Ministry of Industry and Ministry of Energy, which are particularly relevant to the objective of this project: (i) Draft Country Strategy for the Next 20 years (2017-2036); (ii) Approach for Industrial Development toward New Era of Industry (Industry 4.0); (iii) SME Promotional Master Plan 2012-2016 by the Ministry of Industry; and (iv) Energy Efficiency Plan 2015-2036 by the Ministry of Energy.

*Output 1.1.2 – Awareness campaign promoting low-carbon technologies for SMEs*

Under this Output, an awareness campaign will be conducted to increase awareness of the benefits associated with adopting low-carbon technologies, including improved energy efficiency and reduced costs and environmental impact. The workshops organized as part of this campaign will be provided to at least 600 participants stemming from SMEs, local experts, industry personnel, local equipment and service providers, and government agencies, at the national and provincial/district levels. In addition to providing essential information on low-carbon technologies, the workshops will also provide participants with the opportunity for knowledge sharing and network development, particularly between SMEs, equipment/service providers, and banks. Where possible, the project will work with industrial/sectoral associations to extend the outreach of the project beyond the direct beneficiaries and build capacity and awareness within the associations.

*Output 1.1.3 - Financing schemes for the adoption of low-carbon technologies by SMEs facilitated and promoted*

This Output will review existing government financial support offered to SMEs to encourage productivity improvements, energy savings, cost reductions, and 3R improvements (Reduce, Reuse and Recycle). Having compiled and reviewed the existing schemes, the project will present the findings in a reader-friendly package to SMEs to improve their awareness of the available funding schemes; the package will be disseminated at awareness raising events and via the Information and Leaning Platform developed under Output 2.1.2. In addition, the project will present their findings to government counterparts, including suggested revisions, improvements, and best practices to be discussed and reviewed at a dedicated workshop.

***Component 2: Capacity building and implementation of low-carbon technologies in SMEs***

**Outcome 2.1 Improved capacity and knowledge management supports the improvement of energy efficiency in SMEs**

In order to tackle the technical and informational barriers faced by SMEs in Thailand, the project will provide technical capacity building to a variety of stakeholders, as well as develop a knowledge management platform to institutionalize and disseminate the information and knowledge assets created through the project. This approach will also support the

sustainability strategy of the project, allowing the national partners to continue offering the trainings and knowledge products after the project completion date, and providing recipients with continued access to the latest information related to low-carbon technologies and energy efficiency in Thailand. Efforts will be taken to ensure that both women and men have equal opportunity to participate in and benefit from all capacity building activities.

*Output 2.1.1 - Technical capacity building on low-carbon technologies and EnMS of local technical experts, equipment and service providers, banking/financial institutions and industry*

In order to increase the adoption of low-carbon technologies and EnMS in Thai SMEs and overcome the limited technical expertise in this field amongst SMEs, the project will build capacity on energy efficiency improvements and low-carbon technologies. This approach will help develop the market of energy efficiency products and services in Thailand, while also increasing the number and quality of bankable project proposals prepared by SMEs. The training approach will be two pronged: (i) a 2-day User training will provide industry representatives with an improved understanding of low-carbon technologies and EnMS, as well as the associated benefits and various options; and (ii) an in-depth Technical Training will focus on the technical aspects of low-carbon technologies, best operating practices, and investment appraisal for implementation projects. To complement the in-classroom technical training, on-the-job training will also be facilitated through the recruitment of host factories for hands-on experience for trainees, as well as laying the groundwork for the implementation activities under Output 2.1.2. Throughout the duration of the project, at least 50 local technical experts and equipment/service providers will complete the technical training, and at least 300 industry representatives will complete the 2-day User training. In order to support the sustainability of the training, the project will take a train-the-trainers approach for technical experts, while also working closely with relevant national partners (both government and private sector) to institutionalize the approach.

In addition, the output of this component will directly link with Output 1.1.3 by providing training to banking and financial institutions and build their capacity and knowledge on the advantages of and potential for implementation of energy management and low-carbon technologies in SMEs. The output will contribute to the facilitation of Output 2.2.1, by encouraging banking and financial institutions to provide financing options for SMEs, thereby promoting the adoption of low-carbon technologies and improved operating practices in the sector,

*Output 2.1.2 – An Online Information and Learning Platform (I&LP) on low-carbon technologies established and dissemination materials developed*

In line with the Thai Government's policy on converting the Thai economy to a Digital Economy, as well as the sustainability and scaling-up strategy of the project, an Information and Learning Platform (I&LP) will be established by the project as a knowledge management tool. The Platform will provide SMEs with electronic and internet-accessible low-carbon technology-related information and training services, thus creating awareness and improving communication channels for SMEs, as well as supporting the other project activities related to awareness and capacity building. Specifically, the Platform will consist of various components that are useful for SMEs, such as information on energy efficiency, clean and low carbon technologies, available financing schemes (identified in Output 1.1.3), training materials (Output 2.1.1), case studies and results of implementation projects (Output 2.2.1), etc. The platform will additionally make linkages to showcase the impact (including case studies, training materials and other outcomes) made by related GEF-UNIDO projects, such as the project on Industrial Energy Efficiency (GEF ID 3786). The platform will be updated regularly and managed by the DIP. To ensure that the Platform will continue to serve as a valuable and up to date information channel to SMEs beyond the project lifetime, the project will work closely with the DIP in the design of the platform and expand it as necessary to serve future growing needs of SMEs. To encourage ongoing dialogue between the various market players, the project will develop an online forum within the web-based platform where participants can interact and have queries answered in the local language as to products, services, vendors, consultants, etc. Furthermore, dissemination materials, such as informational and promotional brochures and leaflets will be developed during the course of the project.

**Outcome 2.2 Increased competitiveness of selected SMEs as a result of increased adoption of low-carbon technologies and improved operating practices.**

*Output 2.2.1 - Implementation of low-carbon technologies and EnMS in SMEs*

To encourage the implementation of low-carbon technologies and EnMS in their facilities, the project and its associated experts will provide SMEs with technical expertise, such as preparation of detailed action plans (project design, financial improvement measures, and technical assistance, results verification, etc.). The project will also use the skills

of experts (both women and men) trained under the capacity building Output, to conduct energy efficiency assessments, due diligence, and to provide technical assistance for investment in low-carbon technologies, as well as EnMS, in SMEs. Initially, these implementation projects will focus on the "low-hanging fruit" improvements (no- to low-cost changes) to build confidence within the partner enterprises and also showcase the results. Once these savings have been verified and confidence is created, larger improvement projects will be advocated and supported.

The project will target the following industrial sectors: (i) food and beverage; (ii) automotive; and (iii) ceramics. In order to encourage upscaling and replication, the proposed project will engage the support of national and local Chambers of Commerce and industrial associations to promote the application of low-carbon technologies and best practices within their respective networks, as well as industry champions for early adoption. The total number of SMEs to implement low-carbon technologies and EnMS under this project will be 30 factories. In order to also encourage replication and upscaling, the results of these projects will be disseminated through the Information and Learning Platform, as well as through the communication networks of national partners. Where external financing is needed, the project will facilitate the process of SMEs gaining funding from the appropriate partners (i.e. government funds, SME banks, etc.), in particular from those banks that have been identified as project partners.

***Component 3: Monitoring and Evaluation***

**Outcome 3.1 Effectiveness of the outputs assessed, corrective actions taken and experience documented**

Project implementation will be monitored and evaluated on an ongoing basis for improved replication of the project activities during and after the project period. The monitoring methodology will be conducted on a periodic basis in line with the GEF, UNIDO and government requirements. Specifically, these will include: (i) Project and its activities monitored and evaluated on a regular basis in line with GEF, UNIDO, and government requirements; and (ii) Terminal Evaluation Report completed.

A detailed description of the activities under this component is provided in Part II, Section C: Describe the Budgeted M&E Plan, as well as Annex F: Monitoring and Evaluation Plan.

**A.6 Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:**

| Risk | Risk Rating | Mitigation Measure |
|---|---|---|
| **Policy and institutional risk:** Change in national priorities lead to delays and reductions in the effectiveness of delivery of the project outputs. | Low | The Department of Industrial Promotion (DIP) of the Ministry of Industry is the National Executing Agency and has been a close partner of UNIDO on a number of ongoing projects in Thailand. DIP has been closely involved in the development of the project, throughout the PPG phase, and therefore, has a strong ownership of the project, which is closely in line with the mandate. Furthermore, industrial energy efficiency and energy issues have been a key objective and strategy of the Thai government in recent years, and therefore no change in this focus is expected. |
| **Technical risks:** Associated with upgrading/ installing of energy efficient technologies. | Low | UNIDO will employ the services of highly skilled experts with specific expertise in energy efficiency and proven training skills from other countries to ensure that high-quality and comprehensive trainings serve to mitigate this risk. While low-carbon technologies are relatively new to the Thai SME sector, they are considered proven and widely available technologies, and as such, no technical risk is expected. |

| Risk | Risk Rating | Mitigation Measure |
|---|---|---|
| **Financial risk:** Delay in financing of technology investment projects. | Medium | As energy efficiency improvements in SMEs are often no- to low-cost, access to external financing is not expected to be a crucial factor for many of the improvement projects. If, however, external financing is required, close engagement with financial institutions and enterprises, as well as capacity building on the development of bankable investment projects, will mitigate this risk. |
| **Market risk:** SMEs have limited willingness to invest additional funds for improved energy efficient measures. | Medium | The proposed measures for mitigation of this risk include: (1) provision of capacity building assistance to different players in the market for increased awareness and availability of supportive financial mechanisms/policies for the development of appropriate market initiatives; (2) promotional campaigns and capacity building to a variety of project stakeholders; and (3) showcasing of successful SME project demonstrations through the Information and Learning Platform and national partners. These measures will ensure that the market risks are minimized and their impact is reduced. |
| **Climate Change risk:** | Low | The key impacts of climate change in Thailand, as identified by the 4th Assessment Report of the IPCC, are: "severe flood risk, and a decline in annual flow of the Red and Mekong Rivers resulting in increased water stress."[11]<br>As it is unlikely that the project activities would be negatively impacted by the above outlined risks, the associated climate change risk has been assessed as low. Nevertheless, efforts will be made to mitigate any potential risk through an appropriate selection of project sites. |
| **Social and Gender Risk:** Resistance against or lack of interest in the project activities from stakeholders, especially with regard to the active promotion of gender equality.<br>Low participation rates of suitable female candidates due to lack of interest, inadequate project activity or missing qualified female population within engineering sector. | Medium | As mentioned in Section B.2., the Thai industrial sector tends to be male-dominated, with very few women working in industrial facilities, thus making it more difficult to identify women participants for the various trainings and workshops. In an effort to overcome this barrier, the Project will pursue thorough and gender responsive communication and ensure stakeholder involvement at all levels, with special regard to involving women and men, as well as CSOs and NGOs promoting GEEW. This shall mitigate gender related risks, promote gender equality, create a culture of mutual acceptance, and maximize the potential contribution of the project to improving gender equality in the energy field. |

[11] http://wwf.panda.org/about_our_earth/aboutcc/problems/rising_temperatures/hotspot_map/thailand.cfm

## A.7. Coordination with other relevant GEF financed initiatives

As indicated in the PIF, the proposed project will seek synergies with the GEF projects and other UNIDO projects in Thailand, supplementing these efforts to achieve GHG emission reductions. The project will build on experiences and achievements of the following projects to ensure that it is complimentary to each other.

1. *Industrial Energy Efficiency (IEE) project:* This GEF-UNIDO project (GEF ID: 3786) has been under implementation since 2011 and aims to promote energy efficiency in industries through the introduction of ISO Energy Management Standard incorporating industrial energy systems optimization. Due to the project scope which primarily focuses on large enterprises, few SMEs have been able to participate in the project, but could be contacted to take part in this proposed project. During the Mid-Term Review (MTR) it was highlighted that the positive reputation gained by the IEE project has raised the demand within SMEs for corresponding services, and the proposed project intends to leverage on this interest. Owing to the growing demand, and in response to the successful implementation of the IEE project in Thailand, government counterparts have requested UNIDO to provide similar, but adapted services to the SME sector. By building upon the existing knowledge and awareness developed by the IEE project, synergies can be created to improve the efficiency and outreach of the proposed project.
2. *Promoting Energy Efficiency in Commercial Buildings in Thailand (PEECB):* While the focus of this GEF-UNDP project (GEF ID: 4165) is on buildings, rather that industry as in the case of the proposed project, synergies in terms of policy improvements and analysis and the promotion of energy efficiency technologies and practices will be explored where possible.
3. *GEF UNIDO Cleantech Programme for SMEs (GEF ID: 5800):* the Cleantech Competition and Accelerator Programme organized by the project on an annual basis identifies clean technology innovations developed by SMEs in the fields of energy efficiency, renewable energy, waste to energy and water efficiency. Thus, there is potential for the proposed project to highlight relevant low-carbon technologies among these identified innovations and showcase them to the SMEs participating in the capacity building and implementation activities of the project. This would not only support the Cleantech project by providing demand for the innovations identified by its competition and accelerator programme, but also provide the proposed project with a source of low-carbon technologies relevant to the industrial SME sector.

The proposed project will build upon these projects to further improve the overall efficiency of energy use at industrial enterprises, as well as the efficiency of project execution. The Project Management Unit (PMU) will have regular contact with the implementers of the three projects outlined above to ensure coordination.

## B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

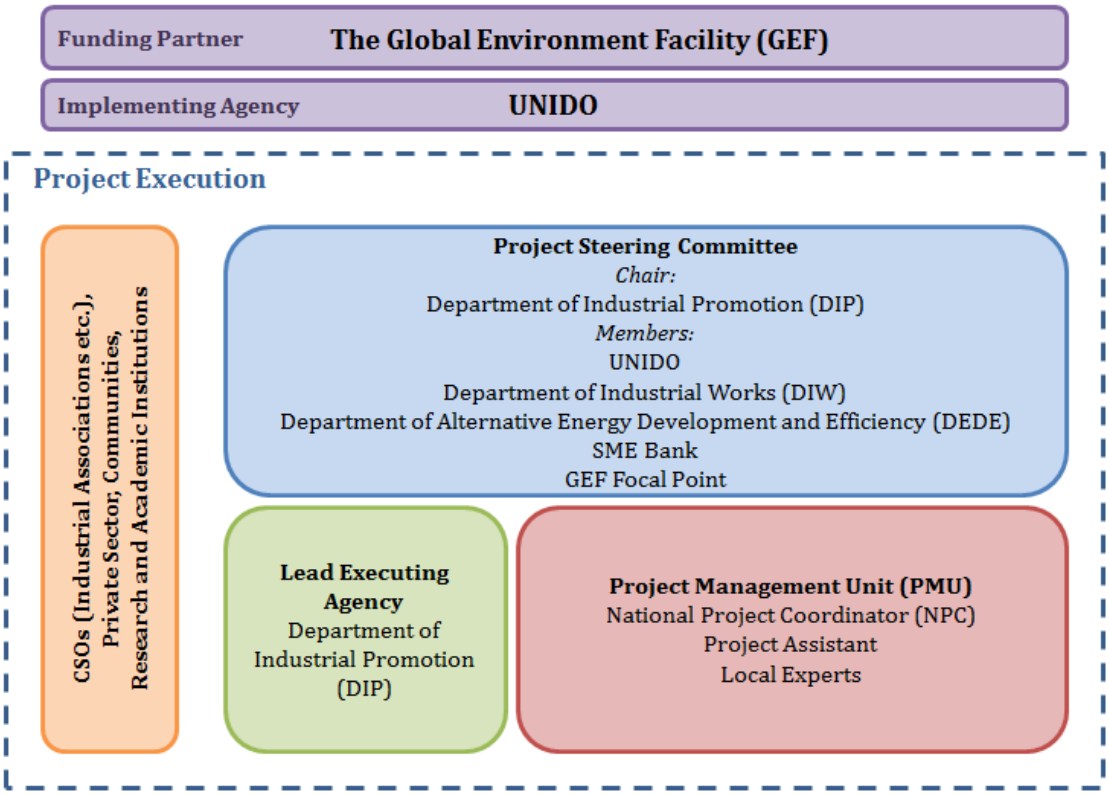
### B.1 Describe how the stakeholders will be engaged in project implementation.

The project will establish a robust institutional mechanism that will facilitate coordination among the various agencies involved. The Project Steering Committee (PSC) will be established and include representatives from UNIDO, the Department of Industrial Promotion (DIP), the Department of Industrial Works (DIW), The Department of Alternative Energy Development and Efficiency (DEDE) and other related agencies, including SME Bank.

Any amendments to the project will be done in accordance with the GEF policy C39. Inf. 3.

In the below diagram proposed project institutional arrangement is shown. The detailed institutional and project management arrangements can be found in Annex H.

**Figure 1: Proposed Project Institutional Arrangement**




| Stakeholder | Role |
|---|---|
| **Government Partners** | |
| **Department of Industrial Promotion (DIP), Ministry of Industry** | The responsibility of the Department of Industrial Promotion (DIP), under the Ministry of Industry, is to encourage establishment of all types of essential industries in Thailand, to increase efficiency of industries, and to promote regional industrialization. The DIP mission includes the following:<br>• To support industrial entrepreneur creation and entrepreneurship development<br>• To foster competitiveness of Thai industrial businesses<br>• To build and improve industrial promotion and development models<br>• To create and develop industrial business service provider networks. |

| Stakeholder | Role |
|---|---|
| | **Role in the Project:**<br>DIP, MOI will act as the project's National Executing Agency, supporting policy and capacity building activities and providing guidance on the overall execution of project activities at the country level. |
| **Department of Industrial Works (DIW), Ministry of Industry** | Through its various divisions, DIW's major responsibilities are: i) to supervise and coordinate industrial business operation activities by following the guidelines of environmental preservation, safety, hygiene and energy economization; ii) to promote and support the capability and efficiency development of industrial business operation for sustained development; iii) to serve as the national information center for industrial works, machines, chemical substances, hazardous substances and volatile substances; and iv) to look after the country's interests in international agreements regarding environment, safety and security. |
| **Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy** | The Department of Alternative Energy Development and Efficiency (DEDE) under the Ministry of Energy is responsible for energy efficiency promotion, energy conservation regulation, energy source provision, alternative development of integrated energy uses, energy technology dissemination in systematic and continuous proceeding to adequately meet the demand from every sector at optimum cost beneficial to the country development and the people better living standard. |
| **Office of International Cooperation on Natural Resources and Environment, Ministry of Natural Resources and Environment** | The Office of International Cooperation on Natural Resources and Environment under the Ministry of Natural Resources and Environment (OICNRE) acts as the National Operational Focal Point of GEF and the secretary of GEF's project selection committee in Thailand. As such, the Office is responsible for preparing the national strategy and operational plan under GEF in accordance with GEF criteria and work plan, which includes monitoring the output of project management and budget funded by GEF, coordinating with the National Political Focal Point of GEF and screen GEF project proposals. To create and develop industrial business service provider networks. |
| **Universities, CSOs and Associations** | |
| **Local Universities/ Research Centers** | The universities/research centers will support the technical training on energy efficiency for SMEs in cooperation with local manufacturers. |
| **Sectoral/ SME/ Industrial Associations** | These associations will be consulted on and take part in the capacity building activities of the project. They will act as communication channels for the dissemination of information and will support awareness raising activities for stakeholders on the benefits of energy efficiency by using their existing networks. |
| **Local and international associations, agencies and experts promoting gender equality and women's empowerment** | Efforts will be made to include gender groups in project preparation as service providers, consultants, industry participants and civil society representatives. Furthermore, special efforts will be made to include ministerial gender focal points in project execution where possible. |
| **Chambers of Commerce** | KADIN offices (both national and local levels) will be engaged in project activities to strengthen linkages between government partners and the private sector. |

| Stakeholder | Role |
|---|---|
| **Financial Sector** | |
| **SME Bank** | The SME Bank, originally established under the Ministry of Industry as the Small Industry Finance Office (SIFO), has a mandate "to conduct business with the aim of developing, promoting and assisting small and medium enterprises to start-up expand or improve their businesses by providing loans, guarantees, venture capital, counseling and other necessary services as prescribed by the Act. |

**B.2 Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):**

Social Benefits:

The local benefits of the project include:

1) Improved capabilities for SMEs to conduct business sustainably resulting in job creation and security. Improving energy efficiency can deliver benefits economy, directly and indirectly. These benefits include employment, trade balance and energy prices. There is no study on the impacts of energy efficiency improvement in Thailand. However, IEA reports that in general, GDP changes due to large-scale energy efficiency policies show positive outcomes with economic growth ranging from 0.25% to 1.1% per year. The potential for job creation ranges from 8 to 27 job years per EUR 1 million invested in energy efficiency measures.
2) Increased opportunities for experts due to increased investment in the SME sector. One of identified barriers in improving energy efficiency among SMEs is lack of knowledge and qualified personnel. Providing experts to assist SMEs in evaluating their energy performance and developing energy efficiency improvement action plan will not only help SMEs to reduce their energy consumption but also the EE experts in increased opportunities. SMEs will be aware of the important roles experts play in supporting their operation and will result in increasing involvement of experts with SMEs.
3) Higher long term profitability due to lower cost of production. Energy cost accounts for approximately 16-25% of total production cost and energy savings will have a direct impact on the bottom line of SMEs.
4. Reduced reliance on fossil fuels. The main fuel for electricity generation in Thailand is fossil fuel (in 2015, 64% natural gas, 9% imported coal, and 10% lignite). It was reported that every unit of electricity reduced will result in a $CO_2$ reduction of approximately 0.5-0.6 kg. Therefore, by reducing energy consumption, SMEs can help lowering Thailand's dependence on fossil fuel and reduce impact on the environment.
5. Higher loan approval due to the increased know-how of financing institutions regards the potential of energy efficiency improvements and technologies. Loan applications are always a difficult process, even for large companies, for SMEs in particular, this process can be very tedious. By providing guidance on how to properly prepare the required documents and correctly calculate energy savings, SMEs' loan applications will have a higher rate of approval.

Gender Dimensions

UNIDO recognizes that gender equality and the empowerment of women have a significant positive impact on sustained economic growth and inclusive industrial development, which are key drivers of poverty alleviation and social progress. The commitment of UNIDO towards gender equality and women's empowerment is demonstrated in its policy on Gender Equality and the Empowerment of Women (2009), which provides overall guidelines for establishing a gender mainstreaming strategy that:

- Ensures that a gender perspective is reflected in its programmes, policies and organizational practices;

- Advances the overall goal of gender equality and the empowerment of women, particularly the economic empowerment of women;
- Benefits from the diversity of experiences and expertise within the United Nations system to advance the internationally agreed development goals related to gender equality and the empowerment of women;
- Accelerates the Organization's efforts to achieve the goal of gender balance, in particular at decision-making levels.

At the operational level, UNIDO has developed an energy-gender guide to support gender mainstreaming of its sustainable energy programmes and initiatives at all stages of the project cycle. In addition to the introduction of basic concepts and strategic approaches, it also includes tools that can be used at relevant points of the project cycle to guide the thought processes and activities.

These tools include:

- Gender categorization tool, which assesses how much direct impact the project will have on gender dimensions;
- Gender mainstreaming check list, which summarizes key considerations which must be considered during project development;
- Gender analysis tool which provides specific questions that can guide the project developer in considering gender dimensions of a project, before full gender analysis is conducted by an expert;
- Gender mainstreaming the project cycle tool, which lists key activities to be considered at each step of the project cycle;
- Gender indicator framework that encourages results based management by indicating potential gender dimensions and quantitative indicators for specific energy interventions.

To ensure that all projects consider gender dimensions from inception, UNIDO has also integrated a robust gender review as part of the project appraisal process both at the technical and organizational level.

*a) Country Context*

*The analysis of the country context in Thailand shows several gender inequalities.* Women make up just over 40% of the Thai labor force and employers are required to provide them the same wages and benefits as men. Despite the fact that more girls are now going to school and more than half of the country's university graduates are female, women are still confined to traditional roles, have fewer opportunities than men for career advancement opportunities and are still concentrated in low-paying jobs. Women are also very under-represented in electoral politics, though the National Women's Development Plan has set ambitious targets to tackle these issues. There are still problems of inequality and domestic violence and stereotypical attitudes tend to limit perceptions of women's physical and psychological abilities and restrict the range of jobs that women enter into. Police and military academies, for example, do not accept female students. Data on gender issues is also quite limited; Thailand will need to gather much more sex-disaggregated data to ensure that all plans, policies and programmes address their differential impacts on men and women.

*b) Sector Context*

*The analysis of the sector context in Thailand shows gender inequalities.*

**Economy:** Thailand is a middle-income country that over the past 20 years has seen remarkable progress in human development, moving from a Human Development Index of 0.678 in 1985 to 0.722 in 2013. In Thailand, the garment industry is the largest export industry, accounting for 60 per cent of total exports (NSO 2012). A survey by the National Statistics Office found that, among subcontracted workers, about half of non-agricultural home-based employment was related to garments and textiles (NSO 2007). Thailand's Office of Homeworker Protection (OHWP) estimated there were over 950,000 homeworkers in 2005, the majority women.[12]

**SMEs:** *Entrepreneurship development programmes for women in the informal sector are not widely available.* Training programmes related to the needs of women and/or training which incorporates gender sensitivity are very rare. Training

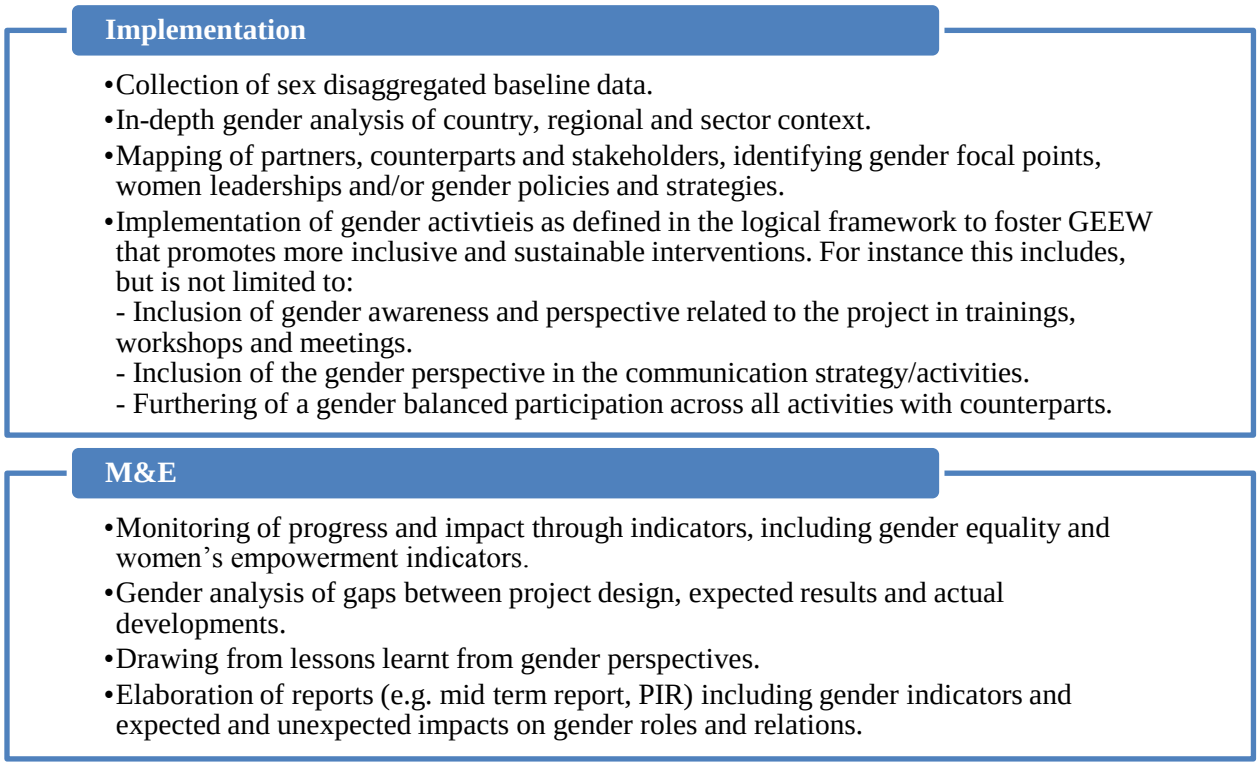
[12] http://wiego.org/informal-economy/occupational-groups/garment-workers

programmes often do not take into account the constraints faced by these women who have low levels of education, limited time and huge work burdens. As a result, these women are blocked from self-development opportunities and unable to improve and upgrade their capacities. Women, therefore, have limited potential to increase the efficiency of their businesses and are unable to make the shift from sub-contracted workers to own-account workers.

*c) Gender dimensions of the project*

This intervention in **Thailand** is expected to have limited direct influence over gender equality and/or women's empowerment in the country and therefore could be classified as a project with "**limited gender dimensions**"[13] according to the UNIDO Project Gender Categorization Tool. Nevertheless, UNIDO recognizes that all energy interventions are expected to have an impact on people and are, therefore, not gender-neutral[14]. In fact, due to diverging needs and rights regarding energy consumption and production, women and men are expected to be affected differently by the project (in terms of their rights, needs, roles, opportunities, etc.). Therefore, regardless of the project's gender category, the project aims to demonstrate good practices in mainstreaming gender aspects into low carbon technology application projects for SMEs, wherever possible, and avoid negative impacts on women or men due to their gender, ethnicity, social status or age. The below figure provides an overview of key issues that will be further considered during the gender mainstreaming of the next steps in the project cycle.

**Figure 2: Key issues in gender mainstreaming the project cycle**




During the PPG phase, a preliminary gender analysis of the country context has been conducted, based on which potential gender dimensions of project outcomes and outputs, as well as potential entry points for gender equality and women's empowerment (GEEW) were developed (see Annex J Preliminary Gender Analysis for further information). Key gender dimensions of the project outcomes and outputs as well as potential gender-relevant indicators have been incorporated into the project's logical framework (see Annex A Project Results Framework for further information).

[13] This would require the project to ensure at least 20% of the project outputs have clearly identified activities promoting gender equality and/ or the empowerment of women, including gender-responsive indicators and a corresponding budget OR at least one indicator in each project output refers to gender in some way. Furthermore, a gender-analysis is conducted of gender issues are included in ESIAs. Please see also "Gender Categorization Tool"

[14] ENERGIA "Turning Information into Empowerment: Strengthening Gender and Energy Networking in Africa. Leusden, 2008; Joy Clancy "Later Developers: Gender Mainstreaming in the Energy Sector", 2009

These proposed gender dimensions will be used as a guide during the implementation of the project as well as during M&E.

*d) Project gender mainstreaming strategy*

The guiding principle of the project will be to ensure that both women and men are provided equal opportunities to access, participate in, and benefit from the project, without compromising the technical quality of the project results.

In practical terms:

- Gender-sensitive recruitment will be practiced at all levels where possible, especially in selection of project staff. Gender neutral TORs will be used to mainstream gender in the activities of consultants and experts. In cases where the project does not have direct influence, gender-sensitive recruitment will be encouraged.
- Whenever possible existing staff will be trained and their awareness raised regarding gender issues.
- All decision-making processes will consider gender dimensions. At project management level, efforts will be made to encourage a gender-balanced composition of Project Steering Committee meetings, and where possible, observers from CSOs/NGOs focused on the empowerment of women will be invited to ensure that gender dimensions. Also at the level of project activity implementation, effort will be made to consult with stakeholders focusing on gender equality and women's empowerment issues. This is especially relevant in policy review and formulation.
- To the extent possible, efforts will be made to promote participation of women in training activities, both at managerial and technical levels. This can include advertising of the events to women's technical associations, encouraging companies to send women employees, etc.
- Gender-disaggregated targets have been incorporated into the Project Results Framework, and will be monitored throughout project implementation. Based on experience under the UNIDO implemented GEF-4 project, Industrial Energy Efficiency in Thailand, trainings and workshops organized for the industrial sector tend to be male-dominated, reflecting the composition of the industrial sector; this issue will be compounded by the fact that the proposed project focuses on the SME sector, and in particular on sectors that are dominated by men; automotive, food and beverage, and ceramics production. These energy-intensive sectors were selected based on the highest potential for energy savings. Thus, gender targets of at least 10% women for the capacity building components have been set in order to reflect the reality of gender composition in the Thai industrial SME sector.

When data-collection or assessments are conducted as part of project implementation, gender dimensions will be considered. This can include sex-disaggregated data collection, performing gender analysis as part of ESIAs, etc.

**B.3. Explain how cost-effectiveness is reflected in the project design:**

The implementation of this project will be closely coordinated with other related projects and initiatives in order to create synergies and avoid overlapping. In addition to the Project Steering Committees (PSC), working groups and other coordination mechanisms will be established when necessary to ensure the effective coordination amongst various project partners, thus promoting efficiency of project activities. In addition, UNIDO's extensive experience working with industry and SMEs, and field presence in Thailand, will support the cost-effectiveness of the project's interventions.

The project has a target of direct GHG reductions of 565,920 tonnes of $CO_2$eq with a total GEF grant of USD 2,092,600 (including agency fees, project grant, and PPG) – meaning that the cost for the GEF per tonne of GHG reduction is expected to be less than USD 4.00. Thus, the project will be very cost-effective.

The project has a target of indirect GHG reductions of 2,515,200 tonnes of $CO_2$eq for bottom up analysis and 8,972,749 tonnes of $CO_2$eq. Combining the direct and indirect emissions reductions, the cost per tonne of GHG reductions to the GEF ranges from USD 0.22 (using top-down indirect emissions reductions estimates) to USD 0.68 (using bottom-up indirect emissions reductions estimates).

The GHG reduction targets have been calculated based on the GEF Manual for Calculating GHG Benefits of GEF EE&RE Projects. These calculations are further elaborated on in Annex E: Energy Savings and GHG Calculations.

**Innovative aspects**

The project promotes the application of innovated low-carbon technologies in the SME sector of Thailand. It works both on the supply side (local technical experts, equipment and service providers, financial/banking institutions) and demand side (SMEs and industrial users) to improve energy efficiency through:

- The use of best practices involving innovative technological and management improvements to improve energy efficiency in SMEs.
- The assistance in development of financial schemes directly targeted at SMEs to promote the uptake for manufacturing and sale of more efficient technology.
- The encouragement of replacing inefficient technology with highly efficient and energy saving substitutes.

**Sustainability**

The sustainability of the project will be insured through a number of mechanisms as outlined in Section I I.A.5 above:

**Component 1** will ensure sustainability by sensitizing the Thai market on existing policies, as well as supporting policy-makers to improve the existing regulatory framework and facilitate the access of SMEs to financial schemes for energy efficiency and low-carbon technology improvements. These activities will result in a more conducive regulatory and financial framework for SME beyond the project's lifetime.

**Component 2** will ensure sustainability by building the capacity, as well as technical skills and awareness, of local technical experts, equipment and service providers, banking/financial institutions and the SME industry through a holistic and practically-oriented training approach. Showcasing demonstration projects and distributing detailed case studies that demonstrate the benefits and effectiveness of the interventions will encourage the uptake and increase the market demand for energy efficiency improvements. The case studies, training and dissemination materials will be made readily available on an Online Information and Learning Platform to be established, which will serve as information channel to SMEs training services and financial schemes accessible, as well as a source on new developments in energy efficiency field. The DIP will manage the learning platform after project closure to ensure that the I&LP will be continuously updated beyond the project lifetime,

**Potential for scaling up**

As noted in Section II.A.4 above, about 2.6 million Small and Medium-sized Enterprises (SMEs) currently exist in Thailand and the number is expected to grow by 10% annually. The project will address energy efficiency measures in a few selected sectors to demonstrate the potential for energy savings in SMEs. This will leave a significant amount of space within the market for scaling up. The scaling up will occur by improving the regulatory framework, cooperation with financial institutions, which will provide a market push for financing for EE investments, capacity building amongst industrial energy experts that can consult for other companies, and working with equipment and service providers to improve their business plans for energy efficient technology.

As a result of these project activities, it can be expected that (i) on the demand side, the SME sector will increasingly seek more energy efficient technology and implement better operating practices and (ii) on the supply side, energy consultants, equipment and service providers and financial institutions, etc. will be better able to supply the SME sector with appropriate advice, products, and finance to meet their needs for improved energy efficiency.

## C. DESCRIBE THE BUDGETED M &E PLAN:

Project monitoring and evaluation (M&E) will be conducted in accordance with established UNIDO and GEF procedures. The M&E activities are defined by Project Component 3 and the concrete activities for M&E are specified and budgeted in the M&E plan. Monitoring of the project will be based on indicators (for project Components 1 and 2) defined in the results framework given in Annex A (which also details the means of verification) and the annual work plans. Monitoring and Evaluation will make use of the GEF Tracking Tool, which will be submitted to the GEF Secretariat twice during the duration of the project: at CEO Endorsement, and at project closure.

UNIDO as the Implementing Agency will involve the GEF Operational Focal Point and project stakeholders at all stages of project monitoring and evaluation activities in order to ensure the use the evaluation results for further planning and implementation.

According to the Monitoring and Evaluation policy of the GEF and UNIDO, follow-up studies like Country Portfolio Evaluations and Thematic Evaluations can be initiated and conducted. All project partners and contractors are obliged to (i) make available studies, reports and other documentation related to the project and; (ii) facilitate interviews with staff involved in the project activities.

The overall objective of the M&E process is to ensure successful and quality implementation of the project by: i) tracking and reviewing the execution of project activities; ii) taking early corrective action if performance deviates significantly from the original plans; and iii) adjusting and updating project strategy and implementation plan to reflect possible changes on the ground results achieved and the corrective actions taken.

### a. Monitoring

A detailed monitoring plan for tracking and reporting on project time-bound milestones and accomplishments will be prepared by UNIDO in collaboration with the established Project Management Unit (PMU) and project partners at the beginning of project implementation and then will be updated periodically. Monitoring activities will be carried out on the basis of the periodic reports developed by the PMU with the frequency aligned to the semi-annual reports.

By making reference to the impact and performance indicators defined in the Project Results Framework (Annex A), the monitoring plan will track, report and review the project activities and accomplishments in relation to:

a. Implementation;
b. Conduct of various capacity building trainings and their usefulness;
c. Level of awareness and technical capacity of relevant institutions in the market on energy efficiency improvement opportunities;
d. Government initiatives to support the adoption of energy efficiency improvements in SMEs
e. Replication potential of similar projects in other SMEs;
f. $CO_2$ emission reduction resulting from the implemented projects;
g. $CO_2$ emission reduction potential from other replication projects; and
h. Effectiveness and usefulness of the dissemination activities such as trainings, seminars, site visits, performance reports, project website, leaflets, etc.

### b. Reporting

The PMU will present a report to UNIDO every six months with detailed information on the progress of the project as per the annual implementation plan and activities that have been carried out during the period of each report. An annual report shall be submitted by PMU at the end of each project cycle year with a summary of activities carried out over the year and will be the basis of Project Implementation Reports (PIRs). The annual report will also cover the benefits gained and impacts made through the implementation of the project. In addition, the report will include evidence to demonstrate the progress made in the achievement of the indicators highlighted in the Project Results Framework in Annex A.

### c. Evaluation

The project will be subjected to an independent Terminal Evaluation, which will be conducted within six (6) months after project closure. The Terminal Evaluation will look at the impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefit goals. It will also focus on

various other activities of the project such as the construction and operation of the demonstration plant, assessment of the effectiveness of the training, financial support facilitation, etc. The Terminal Evaluation will also provide recommendations for follow-up activities.

**Table 5: Proposed budget for M&E activities**

| **Type of M&E activity** | **Engaged Parties** | **Budget USD** *Excluding PMU Staff time* | **Time frame** |
|---|---|---|---|
| Project inception workshop and report | PMU, UNIDO, consultants | 6,000 | Within first two months of Project start up, with reports immediately following Inception Workshop |
| Measurement of Means of Verification for Project Progress and Performance | UNIDO, M&E expert | 5,000 | Start verification of projects annually and at the project end |
| Semi-Annual project progress reports | PMU | 4,000 | Every six months |
| Project Terminal Report | UNIDO, PMU | 5,000 | At end of project implementation |
| Project Terminal Evaluation | Independent evaluator, PMU, UNIDO PM, and UNIDO Evaluation Group | 30,000 | Within 6 months of completion of project implementation |
| **TOTAL Indicative Cost** | | **USD 50,000** | |

## D. LEGAL CONTEXT:

"The Kingdom of Thailand agrees to apply to the present project, mutatis mutandis, the provisions of the Revised Standard Technical Assistance Agreement concluded between the United Nations and the Specialized Agencies and the Government on 4 June 1960."

## 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(s) with this form. For SGP, use this OFP endorsement letter).

| NAME | POSITION | MINISTRY | DATE *(MM/dd/yyyy)* |
|---|---|---|---|
| **Mr. Chote Trachu** | Permanent Secretary & Operational Focal Point | MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT | 02/15/2013 |

**B. GEF AGENCY(IES) CERTIFICATION**

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

| Agency Coordinator, Agency Name | Signature | Date *(Month, day, year)* | Project Contact Person | Telephone | Email Address |
|---|---|---|---|---|---|
| Mr. Philippe R. Scholtès, Managing Director, Programme Development and Technical Cooperation (PTC), UNIDO GEF Focal Point |  | 08/05/2016 | Mr. Sanjaya Shrestha, Industrial Development Officer, PTC/ENE/IEE  | +43 1 26026 3730 | S.Shrestha@unido.org |

**ANNEX A: PROJECT RESULTS FRAMEWORK**

| Project Narrative | Indicator | Baseline | Target | Sources of Verification | Assumptions/Risks |
|---|---|---|---|---|---|
| **Project objective**<br>To promote and support adoption of energy efficient practices and technologies in selected Small and Medium Enterprises (SMEs) in Thailand for improved competitiveness and a greening of industry. | Lifetime energy savings and GHG emission reductions due to implementation of energy efficiency in SME sector. | Limited direct and indirect energy savings by industry. | Direct energy savings: Annual savings of 506,460 GJ at the end of the project;<br>Direct GHG reductions: 56,692 tonnes of $CO_2$eq per year at the end of the project. | Terminal Evaluation Report;<br>Peer-to-peer network;<br>Project evaluation report. | Assumes continued support of government bodies and banking institutions;<br>Assumes it will be possible to convince industries to undertake low-risk investments. |
| **Component 1: Policy analysis and improvement for the promotion of low-carbon technologies within Thai SMEs** | | | | | |
| *Outcome 1.1: Improved understanding and awareness of existing policy gaps and enabling policies support the improvement of existing framework.* | Number of policy improvements/ guidelines endorsed by stakeholders. | A number of policies focused on promoting innovative technologies and SMEs exist, but their utilization rates are low and accessing certain incentives is overly complicated. | Proposed policy improvements/ guidelines are endorsed by stakeholders at a policy workshop. | Official documents | National authorities are willing to endorse specific policy documents;<br>Interest by stakeholders to promote EE technologies exists and can be maintained. |
| Output 1.1.1: Policy Gap and Barrier Analysis conducted, and key policy recommendations proposed to Thai policy-makers; | Number of analytical studies of the existing policy framework completed.<br><br>Gender dimensions included in the policy review and formulation. (y/n) | A number of policies exist, but a comprehensive gap and barrier analysis in terms of their relevance to promoting low-carbon technologies in SMEs has not been done. | 1 policy gap and barrier analysis completed and shared with stakeholders. | Policy gap and barrier analysis document (including gender dimensions, where relevant). | Active involvement of project stakeholders. |
| Output 1.1.2: Awareness campaign promoting low-carbon technologies for SMEs | Number of participants attending the project organized | Baseline projects in Thailand have conducted some initial awareness raising activities, but these | 600 local experts, industry personnel, local equipment and service providers, and | Workshop reports. | Willingness of local experts, industry personnel, local equipment and service providers and government |

| Project Narrative | Indicator | Baseline | Target | Sources of Verification | Assumptions/Risks |
|---|---|---|---|---|---|
| | awareness raising events (disaggregated by gender). | have been limited to energy audits, which have not had a widespread impact. | government representatives (at least 10% women) attend awareness raising events. | | representatives to attend awareness raising events. |
| Output 1.1.3: Financing schemes for the adoption of low-carbon technologies by SMEs facilitated and promoted | Number of "reader-friendly" packages provided to SMEs on available financing schemes.<br><br>Gender dimensions included in the package. (y/n) | A number of financing schemes are available for SMEs to upgrade equipment and operating practices, but SMEs are often unaware of them or do not understand how best to access the financing schemes. | 1 "reader-friendly" package provided to SMEs on available financing schemes (via workshops/ trainings and the Information and Learning Platform), (including gender dimensions, where relevant). | Official Document. | Active involvement of project stakeholders. |
| | Number of consultation workshops held for government counterparts. | | 2 consultation workshops held for government counterparts. | Workshop reports. | Active involvement of project stakeholders. |
| **Component 2: Capacity building and implementation of low-carbon technologies in SMEs** | | | | | |
| *Outcome 2.1: Improved capacity and knowledge management supports the improvement of energy efficiency in SMEs* | Number of participants that increased their capacity and knowledge of low-carbon technology adoption in SMEs; | Baseline projects in Thailand have conducted some initial capacity building activities, but these have been limited in scope and geographical coverage. | 350 participants (at least 10% women) increase their capacity and knowledge of low-carbon technology adoption in SMEs. | Workshop feedback reports.<br><br>Workshop reports. | Willingness of local experts, local equipment and service providers, and industry representatives to attend trainings. |
| Output 2.1.1: Technical capacity building on low-carbon technologies and EnMS of local technical experts, equipment and service providers, | Number of local technical experts and equipment/ service providers attending technical training. | User- and Expert-level trainings on EnMS have been conducted by the IEE project but primarily targeting representatives of medium to large | 50 local technical experts and equipment/ service providers (at least 10% women) attend the technical training. | Training reports. | Willingness of local experts, and local equipment and service providers to attend trainings. |

| Project Narrative | Indicator | Baseline | Target | Sources of Verification | Assumptions/Risks |
|---|---|---|---|---|---|
| financial/banking institutions and industry. | Number of industry representatives attending the 2-day User training (disaggregated by gender). | enterprises; technical trainings on low-carbon technologies for SMEs are not available in the market. | 300 industry representatives (at least 10% women) attend the 2-day User training. | Training reports. | |
| Output 2.1.2: An Online Information and Learning Platform (I&LP) on low-carbon technologies established and dissemination materials developed | Number of I&LPs on low-carbon technologies operational. | No comprehensive I&LP focusing on low-carbon technologies in SMEs is present in the Thai market. | 1 I&LP on low-carbon technologies operational. | Website, press releases, dissemination materials. | Sufficient support of project stakeholders to provide relevant content for Platform. |
| *Outcome 2.2: Increased competitiveness of selected SMEs as a result of increased adoption of low-carbon technologies and improved operating practices* | Number of low-carbon technology/ EnMS projects implemented by SMEs. | While some SMEs in Thailand have adopted aspects of EnMS and some low-carbon technologies, it is not common and the results are not widely disseminated. | 600 low-carbon technology/ EnMS replication projects implemented by SMEs by the end of the 10$^{th}$ year (from project begin). | Project progress reports, websites of enterprise, case studies, etc. | Willingness of SMEs to implement such projects. |
| Output 2.2.1: Implementation of low-carbon technologies and EnMS in SMEs | Number of low-carbon technology/ EnMS projects implemented by SMEs with support from the project. | SMEs currently lack the technical expertise to properly assess the potential of improvement projects and access the required funding. | At least 30 low-carbon technology/ EnMS projects implemented by SMEs with support from the project. | Assessment reports. | Willingness of SMEs to implement such projects. |

## ANNEX B: RESPONSES TO PROJECT REVIEWS

**(**from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work programme inclusion and the Convention Secretariat and STAP at PIF).

**N/A**

## ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS[15]

A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

| PPG Grant Approved at PIF: **USD 34,000** | | | |
|---|---|---|---|
| ***Project Preparation Activities Implemented*** | ***GEF/LDCF/SCCF/NPIF Amount ($)*** | | |
| | ***Budgeted Amount*** | ***Amount Spent To date*** | ***Amount Committed*** |
| Baseline Assessment | 10,000 | 10,000 | 0 |
| Stakeholder Consultation and Commitment Confirmation | 10,000 | 10,000 | 0 |
| Detailed Project Design and Calculations of GHG Emission Savings | 14,000 | 9,178 | 4,822 |
| **Total** | **34,000** | **29,178** | **4,822** |

The PPG phase included various activities to assure the appropriate selection and commitment of Stakeholders, assessment of the baseline, as well as detailed project design and computation of the potential and target GHG emission savings. Due to the need to refocus the project during the PPG phase, additional consultations were needed with various stakeholders, as well as national and international experts. The balance of USD 4,822 from the PPG phase will be used for preparation activities to be carried out under the implementation phase of the proposed project.

[15] If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

**ANNEX D: CALENDAR OF EXPECTED REFLOWS (**if non-grant instrument is used**)**

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/NPIF Trust Fund or to your Agency (and/or revolving fund that will be set up)

N/A

## ANNEX E: ENERGY SAVINGS AND GHG CALCULATIONS

The project interventions will lead to energy savings, resulting in consequent GHG emission reductions resulting from linking the projects with financing mechanisms for EE. This is to be undertaken within Component 2 of the project "2, Capacity building and implementation of low-carbon technologies in SMEs" under Outcome 2.2 "Increased competitiveness of selected SMEs as a result of increased adoption of low-carbon technologies and improved operating practices" with a total estimated investment over the project period of USD 7.594 million.

The global benefits in terms of avoided $CO_2$ emissions are estimated as follows:

### Direct GHG reductions

Emission reductions achieved by demonstration projects that are planned and implemented as part of the project as well as energy efficiency investments leveraged as a result of the project during the project's supervised implementation period.

In total, the project is expected to result in:

- Direct annual energy savings of 507,460 GJ in the last year of the project (2019).
- A total 10-year reduction of 5,064,595 GJ (assuming a 10-year lifetime of investments).
- Annual reductions of 56,592 tonnes CO2eq per year as direct GHG reductions in the last year of the project (2019)
- A total 10-year reduction of 565,920 tonnes CO2eq as direct GHG reductions.

The energy savings and GHG emissions calculations are based on energy savings estimates from analysis of a number SMEs within the target sub-sectors within industries in Thailand. These were investigated over the course of the implementation of the TEM project. The methodology utilized is the "Revised methodology for calculating GHG benefits of GEF energy efficiency projects (version 1.0)"[16] – using the Financial Instrument Module.

These calculations are based on the following key parameters:

**Table 1: Key Parameters used for GHG Benefits Calculation**

| # | Parameter | Unit | Value | Source |
|---|---|---|---|---|
| A | Emission factor of electricity | $tCO_2/MWh$ | 0.5330 | GEF GHG Reduction worksheet |
| B | Emission factor of Fuel Oil/Diesel | $tCO_2/GJ$ | 0.0741 | GEF GHG Reduction worksheet |
| C | Emission factor of LPG | $tCO_2/GJ$ | 0.0631 | GEF GHG Reduction worksheet |
| D | Weighted average Reduction of electricity consumption per USD 1000 of investment | MWh per USD 1000 | 11.69 | Based on total investment in electricity-saving measures and savings according to 16 energy audits (see below) – multiplied by 70% (expected amount of total investment towards Electricity saving measures) |
| E | Weighted reduction of Fuel Oil/Diesel consumption per USD 1000 of investment | GJ per USD 1000 | 2.52 | Based on total investment in fuel oil-saving measures and savings according to 3 energy audits (see below) – multiplied by 15% (expected amount of total investment towards fuel oil saving measures) |
| F | Weighted reduction of LPG | GJ per USD | 29.49 | Based on total investment in LPG-saving measures and |

[16] www.stapgef.org/revised-methodology-for-calculating-greenhouse-gas-benefits-of-gef-energy-efficiency-projects-version-1-0/

| # | Parameter | Unit | Value | Source |
|---|---|---|---|---|
| | consumption per USD 1000 of investment | 1000 | | savings according to 5 energy audits (see below) – multiplied by 15% (expected amount of total investment towards LPG saving measures) |
| G | Fraction of investments/ projects likely to occur in BAU | % | 10% | This is the default level in the GEF methodology. |
| H | Lifetime of investments | Years | 10 | This is the appropriate timeframe for industrial EE investments. |
| I | Total investments for Component 2 | USD | USD 7.594 million | USD 784,000 from GEF funds and USD 6,810,000 from co-financing. |

Step 1: Disaggregating the potential energy savings measures according to type of energy saved for each cluster

In order to find the potential for energy efficiency savings, analysis has been undertaken for various types of industries. Details on the savings potential for each type of intervention can be found in Annex H.

**Table 2: Potential for Energy and GHG Savings through EE Measures in the Energy Audits Examined**

| Line | Fuel type (electricity, fuel oil, etc.) | # of audits | Baseline energy use | Units | Energy/Financial Savings | | | Efficiency of Investment |
|---|---|---|---|---|---|---|---|---|
| | | | | | MWh/year or GJ/year | Investment (Baht) | Investment (USD) | MWh or GJ per 1000 USD |
| 1 | Electricity | 16 | 42,674 | MWh | 7,270 | 15,331,927 | $435,195 | 16.70 |
| 2 | Fuel oil | 3 | 176,410 | GJ | 300 | 631,000 | $17,911 | 16.77 |
| 3 | LPG | 5 | 92,381 | GJ | 5,287 | 947,447 | $26,893 | 196.60 |

Step 2: Finding the weighted average of energy consumption per fuel type per USD 1000

In order to utilize the GEF GHG reduction tool for a number of energy sources, it is necessary to come to a weighted average of the amount of each energy source saved per USD 1000 total invested.

This was done as follows:

**Table 3: Key Parameters used for GHG Benefits Calculation**

| # | Parameter | Unit | Value | Source |
|---|---|---|---|---|
| A | Total potential investment for electricity savings | USD | $ 435,195 | See Table 1 above |
| B | Total potential investment for fuel oil savings | USD | $ 17,911 | See Table 1 above |
| C | Total potential investment for fuel oil savings | USD | $ 26,893 | See Table 1 above. |
| D | Total potential investment in the sample analysed | USD | $ 479,999 | A + B + C |
| E | % of investment in EE measures to reduce electricity consumption | % | 70.0% | A / D |

| # | Parameter | Unit | Value | Source |
|---|---|---|---|---|
| F | % of investment in EE measures to reduce fuel oil consumption | % | 15.0% | B / D |
| G | % of investment in EE measures to reduce LPG consumption | % | 15.0% | C / D |
| H | Weighted average reduction per USD 1000 for electricity | MWh per USD 1000 | 11.69 | Based on the sum of the weighted average of line 1 above X E |
| I | Weighted average Reduction per USD 1000 for fuel oil | GJ per USD 1000 | 2.52 | Based on the sum of the weighted average of line 2 above X F |
| G | Weighted average Reduction per USD 1000 for fuel oil | GJ per USD 1000 | 29.49 | Based on the sum of the weighted average of line 3 above X G |

Step 3: Utilizing the GEF's Revised methodology for calculating GHG benefits of GEF energy efficiency projects to calculate Energy and GHG Reductions

The key parameters as described above along with a schedule for investments were input into the GHG calculations tool as follows. In 2017, it was estimated that 20% of the investment would occur, with 40% in each year of 2018 and 2019:

**Table 4: Investment, Energy Savings, and Emissions Reductions for Component 2, Outcome 2.2 "Increased Adoption of Low-Carbon Technologies and Improved Operating Practices"**

| Year | | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|
| **Programme** | Investment in Year (1000 USD) | 0.0 | 1,518.8 | 3,037.6 | 3,037.6 |
| **Baseline** | Investment in Year (1000 USD) | 0.0 | 151.9 | 303.8 | 303.8 |
| **Net** | Direct Cumulative Investment in Place (1000 USD) | 0.0 | 1,366.9 | 4,100.8 | 6,834.6 |
| **Direct Savings** | Incremental Annual Electricity Savings (MWh) | 0 | 15,984 | 47,951 | 79,919 |
| | Incremental Annual Diesel Savings (GJ) | 0 | 3,439 | 10,317 | 17,195 |
| | Incremental Annual LPG Savings (GJ) | 0 | 40,311 | 120,934 | 201,556 |

The total expected direct emissions reductions are then calculated by the GHG tool as follows:

**Table 5: Total Direct Emissions Reductions Expected**

| All Components | Cumulative | | | Annual | | | |
|---|---|---|---|---|---|---|---|
| | ***Total*** | ***2016-2019*** | ***2020-2034*** | ***2016*** | ***2019*** | ***2025*** | ***2035*** |
| Direct Electricity Savings (MWh) | 799,190 | 143,854 | 655,336 | 0 | 79,919 | 79,919 | 0 |
| Direct Diesel Savings (GJ) | 171,949 | 30,951 | 140,998 | 0 | 17,195 | 17,195 | 0 |
| Direct LPG Savings (GJ) | 2,015,562 | 362,801 | 1,652,761 | 0 | 201,556 | 201,556 | 0 |
| Direct Total Energy Savings (GJ) | **5,064,595** | 911,627 | 4,152,968 | 0 | 506,460 | 506,460 | 0 |
| Direct GHG Emission Savings (tCO2) | **565,920** | 101,866 | 464,054 | 0 | 56,592 | 56,592 | 0 |

**Indirect GHG emissions reductions estimates**

Indirect Bottom-up emissions reductions estimate

This project is designed to ensure sustainability and replication of energy efficiency improvements beyond the project cycle. It will do so via the following outputs:

1.1.1 Policy Gap and Barrier Analysis conducted, and key policy recommendations proposed to Thai policy-makers;

1.1.2 Awareness campaign promoting low-carbon technologies for SMEs;

1.1.3 Financing schemes for the adoption of low-carbon technologies by SMEs facilitated and promoted;

2.1.1 Technical capacity building on low-carbon technologies and Energy Management Systems (EnMS) for local technical experts, equipment and service providers, and industry;

2.1.2 An Online Information and Learning Platform (I&LP) on low-carbon technologies established and dissemination materials developed.

Due to these activities within the project and the large potential amount of industries, the "Number of Replications Post-project as Spill over" was given as 4 for Component 2, resulting in the following bottom-up emissions reductions from the GHG reduction tool:

**Table 6: Indirect Bottom-Up GHG Savings Calculation**

| Component | Year of indirect savings | Total | Unit |
|---|---|---|---|
| Indirect Bottom-Up Savings: Component 2 | 2020-2034 | 2,515,200 | $tCO_2$ |

Indirect Top-down emissions reduction estimate

In order to calculate the Indirect-Top-down emissions reduction estimate, it has been assumed that the "Standard Offering Programme" of USD 596 million over 22 years (See the baseline analysis in Section A.4) would represent the entire market potential over that period. The annual market potential was then calculated by dividing the total by 22 – then the 10-year investment potential was calculated by multiplying this annual potential by 10 (see the table below).

Using this as the estimate for the financial market over a 10-year period, the following table shows how the indirect top-down reductions estimate is 8,972,749 tonnes $CO_2$eq – which is well above the indirect bottom-up estimate, but provides a sense of the potential market scope. The top-down estimate would also account for other sub-sectors in industry – not just those directly targeted by the project.

**Table 7: Indirect Top-Down Emissions Reduction Estimate Calculations**

| Programme of investment | Label | Value |
|---|---|---|
| Standard offering programme | | |
| Total programme allocation | A | $ 596,000,000 |
| # of years | B | 22 |
| Allocation per year | C = A / B | $ 27,090,909 |
| 10-year market potential for investment | D = C x 10 | $ 270,909,091 |

| 10-year potential - electricity | Label | Value |
|---|---|---|
| Weighted average reduction (MWh) per USD 1000 for electricity | F | 11.69 |
| Amount of electricity reduction per year (MWh) | G = F x D / 1000 | 3,167,820 |
| Average lifetime of investments (years) | H | 10 |
| Total 10-year market potential - electricity reduction (MWh) | I = G x H | 31,678,202 |
| Tonnes CO2/MWh | J | 0.5330 |
| Total 10-year market potential - electricity reduction (tonnes CO2) | K = J x I | 16,885,605 |

| 10-year potential - fuel oil/diesel | Label | Value |
|---|---|---|
| Weighted average reduction (GJ) per USD 1000 for fuel oil/diesel | L | 2.52 |
| Amount of fuel oil/diesel reduction per year (GJ) | M = L x D / 1000 | 681,571 |
| Average lifetime of investments (years) | N | 10 |
| Total 10-year market potential - fuel oil/diesel reduction (GJ) | O = M x N | 6,815,709 |
| Tonnes CO2/GJ | P | 0.0741 |
| Total 10-year market potential - fuel oil/diesel reduction (tonnes CO2) | Q = O x P | 505,044 |

| 10-year potential - LPG | Label | Value |
|---|---|---|
| Weighted average reduction (GJ) per USD 1000 for LPG | R | 29.49 |
| Amount of LPG reduction per year (GJ) | S = R x D / 1000 | 7,989,261 |
| Average lifetime of investments (years) | T | 10 |
| Total 10-year market potential - LPG reduction (MWh) | U = T x S | 79,892,607 |
| Tonnes CO2/GJ | V | 0.0631 |
| Total 10-year market potential - LPG reduction (tonnes CO2) | W = U x V | 5,041,223 |

| **Total 10-year market potential GHG reduction (tonnes CO2)** | **X = W + Q + K** | **22,431,872** |
|---|---|---|
| Causality factor | Y | 40% |
| Indirect Top-Down Emission Reductions (tCO2) | Z = X x Y | 8,972,749 |

## ANNEX F: MONITORING AND EVALUATION PLAN

### 1. Monitoring

***Project Inception Phase***

A project inception workshop will be conducted during the project inception phase to kick-off the project at the national level. The workshop will include the full project team, national government counterparts, co-financing partners, and key industry stakeholders. The fundamental objective of the workshop will be to introduce the project at the national level. An inception workshop report, featuring proceedings from the workshop including stakeholder insights and opinions will be prepared soon after completing the workshop.

In addition to the inception workshop, several activities will be conducted in this period to ensure all preparatory work has been completed. These will be included in an inception report and will include:

- Introductions of PMU staff and the UNIDO teams;
- Review of the Project Results Framework and minor revisions, if deemed necessary;
- Delineation of specific responsibilities and finalization of the scope of work for PMU experts;
- Finalization of monitoring, evaluation and reporting requirements;
- Finalization of all M&E modalities, including time-frames, meeting schedules, procedures and processes;
- Development and scheduling of consulting packages in line with proposed activities and budgets;
- Formation of the PSC and finalization of detailed first year annual plan;
- Measurement of impact indicators and scheduling future activities for impact monitoring.

Once activities begin, the PMU will be responsible for project monitoring on a day-to-day basis. Periodic monitoring of implementation progress will be undertaken by UNIDO, as appropriate through meetings with project counterparts. UNIDO, and/or the UNIDO Regional office will conduct periodic visits based on an agreed upon schedule and monitoring will occur through the PSC meetings, which will take place at least once a year. The terminal review will be held in the last month of the project operation, for which the PMU is responsible and will submit to UNIDO. The PMU, in conjunction with the PSC members, will be responsible for the preparation and submission of the following reports that form part of the monitoring process.

#### 1.1 Project Implementation Report (PIR)

The PIR is an annual monitoring process mandated by the GEF. It is an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from the ongoing project. Once the project has been under implementation for a year, the project team at UNIDO HQ is responsible for completing the PIR. The PIR should then be discussed at the PSC so that the result is a PIR that has been agreed upon by project staff, the executing agency, and UNIDO.

#### 1.2 Semi-Annual Progress Reports

Short reports outlining main updates in project progress would be provided semi-annually to UNIDO by the PMU.

#### 1.3 Periodic Thematic Reports

As and when called for by UNIDO, the PMU will prepare Specific Thematic Reports, focusing on specific issues or areas of activity. The request for a Thematic Report will be provided to the PMU in written form by UNIDO and will c1early state the issue or activities that need to be reported on. These reports will be used as a form of a lessons learned exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered.

#### 1.4 Technical Reports

These reports will be prepared by the national and international consultants/consulting organizations to be engaged during the project. As part of the Inception Report, the PMU would prepare a draft report list, detailing the technical reports that are expected to be prepared on key areas of activity during the course of the Project, and tentative due dates. This list will be on the basis of consulting packages that will be defined at project start.

#### 1.5 Terminal Review (TR)

The TR will be held in the last month of project operation and is the responsibility of the PMU to prepare and submit to UNIDO. It shall be prepared in draft at least two months in advance in order to allow time for review, and will serve as the

basis for discussions in the TR. The TR considers the execution of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to the sustainability of project results, and acts as the vehicle through which lessons learned can be captured to feed into other projects under implementation or formulation.

The PMU, based on the Terminal Review, will prepare the Project Terminal Report (PTR). This comprehensive report will summarize all activities, achievements and outputs of the project, lessons learned, objectives met (or not met), and structures and systems implemented. The PTR will be the definitive statement of the project's activities during its lifetime. It will also lay recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's activities.

**2. Evaluation:**

The project will be subjected to at least one evaluation as follows:

**2.1 Terminal Evaluation:**

An independent terminal evaluation will take place three months prior to project closure, and will focus on the effectiveness, efficiency, and timeliness of project implementation, highlight issues requiring decisions and actions, and present initial lessons learned on project design, implementation and management. The terminal evaluation will also review impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Terminal Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by the UNIDO Evaluation Group.

In addition, according to the Monitoring and Evaluation policy of the GEF and UNIDO, follow-up studies such as Country Portfolio Evaluations and Thematic Evaluations can be initiated and conducted. All project partners and contractors will be obliged to (i) make available studies, reports and other documentation related to the project and (ii) facilitate interviews with staff involved in the project activities.

## *G.* ANNEX G: PROJECT TIMELINE

| Expected Outputs | Time-Frame | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Y1 | | | | Y2 | | | | Y3 | | | | Y4 | |
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| **Component 1: Policy analysis and improvement for the promotion of low-carbon technologies within Thai SMEs** | | | | | | | | | | | | | | |
| *Outcome 1.1: Improved understanding and awareness of existing policy gaps and enabling policies support the improvement of existing policy framework* | | | | | | | | | | | | | | |
| Output 1.1.1: Policy Gap and Barrier Analysis conducted, and key policy recommendations proposed to Thai policy-makers | | | | | | | | | | | | | | |
| Output 1.1.2: Awareness campaign on promoting low-carbon technologies for SMEs conducted | | | | | | | | | | | | | | |
| Output 1.1.3: Financing schemes for the adoption of low-carbon technologies by SMEs facilitated and promoted | | | | | | | | | | | | | | |
| **Component 2: Capacity building and implementation of low-carbon technologies in SMEs** | | | | | | | | | | | | | | |
| *Outcome 2.1: Improved capacity and knowledge management supports the improvement of energy efficiency in SMEs*<br>*Outcome 2.2: Increased competitiveness of selected SMEs as a result of increased adoption of low-carbon technologies and improved operating practices* | | | | | | | | | | | | | | |
| Output 2.1.1: Technical capacity building on low-carbon technologies of local technical experts, equipment and service providers, banking/financial institutions and industry | | | | | | | | | | | | | | |
| Output 2.1.2: An Information and Learning Platform (I&LP) on low-carbon technologies established and dissemination materials developed | | | | | | | | | | | | | | |
| Output 2.2.1: Implementation of low-carbon technologies in SMEs | | | | | | | | | | | | | | |
| **Component 3: Monitoring and Evaluation** | | | | | | | | | | | | | | |
| *Outcome 3.1: Effectiveness of the outputs assessed, corrective actions taken and experience documented* | | | | | | | | | | | | | | |
| Output 3.1.1 Project and its activities monitored and evaluated on a regular basis in line with GEF, UNIDO, and government requirements. | | | | | | | | | | | | | | |
| Output 3.1.2 Terminal Evaluation Report completed. | | | | | | | | | | | | | | |

## *H*. ANNEX H: INSTITUTIONAL AND PROJECT MANAGEMENT ARRANGEMENT

### I. INSTITUTIONAL ARRANGEMENT:

The project will be implemented by UNIDO as the Implementing Agency (IA) in collaboration with local partners in Thailand. The main national counterparts in the project will include the DIP (MOI), DIW (MOI), DEDE (MOE) and SME Bank. The Project Management Unit (PMU) will be established within the premises of the National Executing Agency (EA), DIP, who will also chair the PSC meetings. The PMU will be responsible for the successful execution of the project and will report to the PSC and the National Project Director (NPD), a high-level official from the DIP (EA). The PMU will adhere to the regulations of the UNIDO/GEF as a general rule for executing the project.

**Department of Industrial Promotion (DIP)**

The Department of Industrial Promotion (DIP), under the Ministry of Industry (MOI), is the National Executing Agency (EA) of the project and will host the PMU and provide in-kind support to the PMU. DIP's key activities include the enhancement of industrial networking of relevant public and private sectors; recommending policies and measures on development, as well as supporting capacity building of SMEs, community-based enterprises, entrepreneurs, and service providers. The DIP mission includes the following: 1) to promote and support industrial entrepreneurship development and SMEs; 2) to foster competitiveness of Thai industrial businesses; 3) to build and improve industrial promotion and development models; 4) to create and develop industrial business service provider networks.

**Department of Industrial Works (DIW)**

The Department of Industrial works (DIW), under the Ministry of industry (MOI), has been implementing the government service system capability development plan by providing the organization with effective work management to the satisfaction of industrial business operators and the people and in response to the objectives and targets of the 8th National Economic and Social Development Plan under the strategy of environmental and natural resource management, social environmental development, human development promotion and support as well as the strategy of popular state development.

Through its various divisions, the role and functions of the Department of Industrial Works include the following: 1) to supervise and coordinate industrial business operation activities by following the guidelines of environmental preservation, safety, hygiene and energy economization; 2) to promote and support the capability and efficiency development of industrial business operation for sustained development; 3) to serve as the national information center for industrial works, machines, chemical substances, hazardous substances and volatile substances'; and 4) to look after the country's interests in international agreements regarding environment, safety and security.

**Department of Alternative Energy Development and Efficiency (DEDE)**

The Department of Alternative Energy Development and Efficiency (DEDE), under the Ministry of Energy (MOE), is responsible for energy efficiency promotion, energy conservation regulation, energy source provision, alternative development of integrated energy uses, energy technology dissemination in systematic and continuous proceeding to adequately meet the demand from every sector at optimum cost beneficial to the country development and the people better living standard.

The Ministerial Regulation on the Organization of the Department of Alternative Energy Development and Efficiency of 2008 prescribed the duties and responsibilities of the DEDE as follows: 1) promote, support and regulate energy conservation activities; 2) research, study and develop alternative energy; 3) prescribe rules, criteria and disseminate technology in relation to the generation, conversion, transmission, consumption and conservation of energy; 4) monitor and assess the outcomes of alternative energy development and energy conservation activities; 5) administer the information in relation to alternative energy and energy conservation; 6) perform any other task stipulated by the laws to be the authority and duties of the DEDE, or other functions as assigned by the Ministry of Energy or the Council of Ministers.

**SME Bank**

The Small and Medium Enterprise Development Bank of Thailand (SME Bank), established under the Act of Small and Medium Enterprise Development Bank of Thailand in 2002, is the principal financial institution for the promotion,

financing and development of the Thai SME sector. The Bank's objective is to carry out businesses aimed at developing, promoting, supporting and facilitating the establishment, operation, expansion or improvement of small and medium enterprises through credit granting, guarantee, joint venture, consultation, advice or other necessary service. The SME Bank's mission include: 1) support government policy in helping and promoting SMEs by financial and other services respond to Thai SMEs need as well as encouraging and developing the potential of Thai SMEs; 2) develop the readiness of human resource in order to support the growth of the bank's customers entering into ASEAN Economic Community; 3) develop information technology and organizational management system for efficiency and good governance.

**Office of International Cooperation on Natural Resources and Environment**

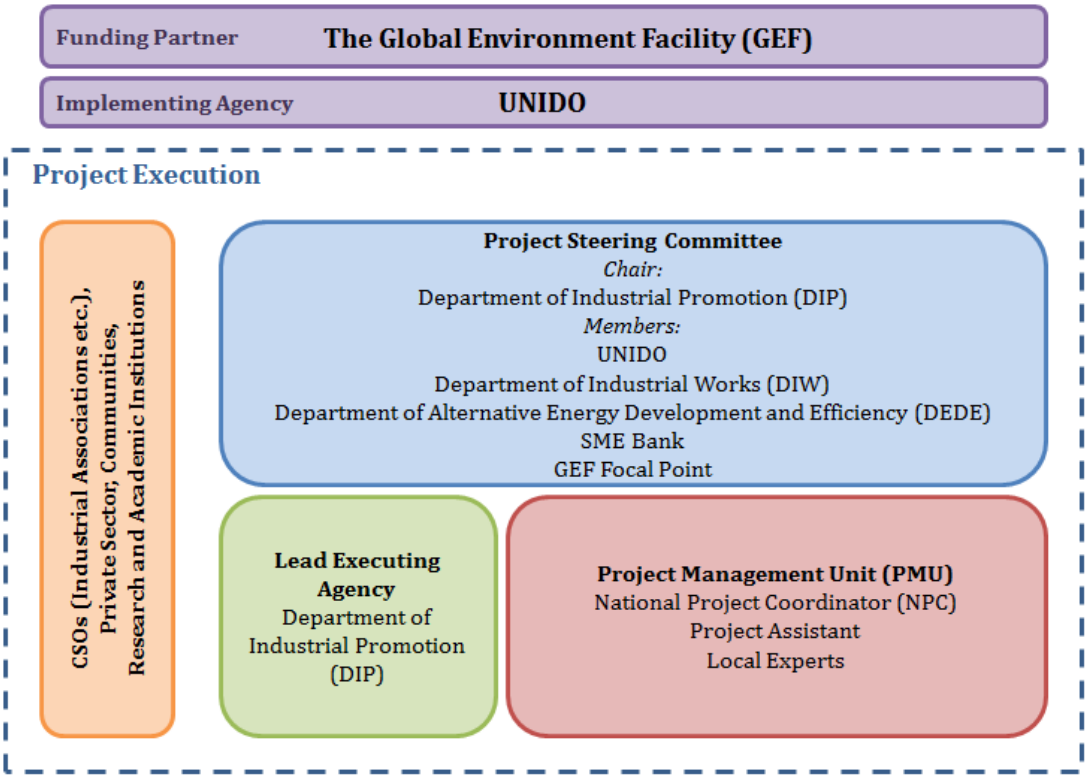
The Office of International Cooperation on Natural Resources and Environment under the Ministry of Natural Resources and Environment acts as the National Operational Focal Point of GEF and the secretary of GEF's project selection committee in Thailand. As such, the Office is responsible for preparing the national strategy and operational plan under GEF in accordance with GEF criteria and work plan, which includes monitoring the output of project management and budget funded by GEF, coordinating with the National Political Focal Point of GEF and screen GEF project proposals.

**Project Implementation Arrangement:**

UNIDO will monitor the overall implementation work of the PMU and report to the GEF on project activities, work plans, financial information, GHG reductions, case studies etc. The field-based activities will be undertaken by the PMU, who will be guided by the PSC, and supported by the UNIDO Regional Office in Bangkok for the smooth execution of activities. The PMU will be fully responsible for day-to-day activities of the project and will report to the UNIDO Project Manager and the NPD on a regular basis on the project activities in addition to seeking their support. The UNIDO Project Manager will report to the GEF as per the GEF requirements on the project implementation and monitoring.

The below figure shows the block diagram of the project implementation/execution arrangement:

**Figure 1: Proposed Project Institutional Arrangement**



## *J.* PROJECT MANAGEMENT UNIT

Project execution will be conducted by the PMU to be established at the DIP premises. The PMU will also be responsible for liaising with national government bodies and other project partners. The PSC will oversee the work of the PMU and general execution of the project in regular interventions.

UNIDO will authorize required expenses for the PMU for execution of project activities. The PMU will report to the UNIDO project manager on a regular basis.

The PMU office will comprise of a National Project Coordinator who will be supported by a team of professionals to manage the entire scope of work. The recruitment of the National Project Coordinator will be done by UNIDO in consultation with the PSC. The team will comprise of a project assistant and local experts. The main tasks of the staff will include drafting detailed terms of reference, issuing request for proposals, evaluating and negotiating tenders and implementing and monitoring project activities. All these activities will be done in close coordination with UNIDO and according to UNIDO/GEF regulations.

The PMU will be responsible for providing the following reports:

- Semi-annual progress and financial reports
- Semi-annual work plans and budgets
- Annual project implementation reviews
- Periodic thematic reports
- Technical reports (As prepared by engaged experts/sub-consultants)
- Project publications (As prepared by engaged experts/sub-consultants)
- Terminal report

The PMU will provide all related information to the evaluation experts for the terminal evaluation. More details regarding the reporting structure are provided under the monitoring and evaluation plan in Annex F.

**Project Steering Committee**

A PSC will be set up to provide advisory inputs for the project. The PSC, chaired by DIP, will meet at least once a year to review the implementation progress, discuss and delineate the execution activities, confirm the work plan for the subsequent year and provide strategic guidance to the PMU on project execution and if required, correct the course of the project. The PSC Minutes of meetings will be prepared by the PMU in consultation with DIP and UNIDO. The committee will comprise of representatives from UNIDO, DIP, DIW, DEDE, SME Bank, GEF Focal Point and other relevant bodies. The final composition of the PSC will be decided during the project inception phase. Representatives from other multi-lateral organizations and relevant line ministries may also be invited to the PSC meetings on an ad hoc basis, depending on their involvement in the project. The PMU will act as the Secretariat of the PSC.

## *K.* ANNEX I: ADDITIONAL INFORMATION ON ENERGY AUDITS IN THE SME SECTORS DISAGGREGATED BY ENERGY SOURCE

**Table 1: Energy Savings Potentials for Electricity**

| Audit # | Sub-sector | Energy Use - original units | Units | Energy Use - standard units | Energy/Financial Savings | | | Efficiency of Investment | |
|---|---|---|---|---|---|---|---|---|---|
| | | | (liters, kg, kWh, etc.) | MWh/year | MWh/year | Investment (Baht) | Investment (USD) | USD per MWh | MWh per 1000 USD |
| 1 | Food and beverage | 13,000,000 | kWh | 13,000 | 225.89 | 1,106,638 | $31,412 | $139.06 | 7 |
| 2 | Food and beverage | 758,808 | kWh | 759 | 23.11 | 54,031 | $1,534 | $66.37 | 15 |
| 3 | Food and beverage | 5,330,292 | kWh | 5,330 | 2,191.00 | 9,000,000 | $255,464 | $116.60 | 9 |
| 4 | Food and beverage | 246,466 | kWh | 246 | 17.62 | 38,665 | $1,098 | $62.28 | 16 |
| 5 | Food and beverage | 133,990 | kWh | 134 | 9.67 | 23,450 | $666 | $68.81 | 15 |
| 6 | Food and beverage | 977,360 | kWh | 977 | 156.09 | 380,000 | $10,786 | $69.10 | 14 |
| 7 | Food and beverage | 2,082,898 | kWh | 2,083 | 62.64 | 425,000 | $12,064 | $192.59 | 5 |
| 8 | Food and beverage | 608,476 | kWh | 608 | 63.67 | 224,000 | $6,358 | $99.86 | 10 |
| 9 | Rubber and plastics | 2,687,420 | kWh | 2,687 | 253.30 | 697,560 | $19,800 | $78.17 | 13 |
| 10 | Rubber and plastics | 2,483,472 | kWh | 2,483 | 259.33 | 413,000 | $11,723 | $45.20 | 22 |
| 11 | Rubber and plastics | 2,482,400 | kWh | 2,482 | 269.32 | 422,710 | $11,999 | $44.55 | 22 |
| 12 | Rubber and plastics | 3,477,000 | kWh | 3,477 | 734.14 | 750,500 | $21,303 | $29.02 | 34 |
| 13 | Electrical equipment | 407,435 | kWh | 407 | 143.91 | 46,150 | $1,310 | $9.10 | 110 |
| 14 | Electrical equipment | 588,000 | kWh | 588 | 86.40 | 56,923 | $1,616 | $18.70 | 53 |
| 15 | Electronics | 7,108,790 | kWh | 7,109 | 2,676.57 | 1,673,300 | $47,496 | $17.75 | 56 |
| 16 | Ceramics | 301,066 | kWh | 301 | 97.15 | 20,000 | $568 | $5.84 | 171 |
| **Total** | | | | **42,674** | **7,270** | **15,331,927** | **$435,195** | **$59.86** | **16.70** |

**Table 2: Energy Savings Potentials for Fuel Oil/ Diesel**

| Audit # | Sub-sector | Energy Use - original units | Units | Energy use - standard units | Energy/Financial Savings | | | Efficiency of Investment | |
|---|---|---|---|---|---|---|---|---|---|
| | | | (liters, kg, kWh, etc.) | GJ Per year | GJ/year | Investment (Baht) | Investment (USD) | USD per GJ | GJ per 1000 USD |
| 1 | Food and beverage | 4,154,151 | Liters | 173,926 | 105.07 | 335,000 | $9,509 | $90.51 | 11.05 |
| 2 | Rubber and plastics | 1,373,620 | MJ/year | 1,374 | 47.70 | 30,000 | $852 | $17.85 | 56.01 |
| 3 | Rubber and plastics | 26,520 | Liters | 1,110 | 147.65 | 266,000 | $7,550 | $51.14 | 19.55 |
| | | | | **176,410** | **300** | **631,000** | **$17,911** | **$59.62** | **16.77** |

**Table 3: Energy Savings Potentials for LPG**

| Audit # | Sub-sector | Energy Use - original units | Units | Energy use - standard units | Energy/Financial Savings | | | Efficiency of Investment | |
|---|---|---|---|---|---|---|---|---|---|
| | | | (liters, kg, kWh, etc.) | GJ Per year | GJ/year | Investment (Baht) | Investment (USD) | USD per GJ | GJ per 1000 USD |
| 1 | Food and beverage | 83,885,529 | MJ/year | 83,886 | 4,479.20 | 790,947 | $22,451 | $5.01 | 199.51 |
| 2 | Food and beverage | 537,555 | MJ/year | 538 | 239.09 | 70,000 | $1,987 | $8.31 | 120.33 |
| 3 | Food and beverage | 1,888,950 | MJ/year | 1,889 | 255.84 | 65,000 | $1,845 | $7.21 | 138.67 |
| 4 | Food and beverage | 548,704 | MJ/year | 549 | 81.16 | 19,500 | $554 | $6.82 | 146.62 |
| 5 | Electrical equipment | 5,520,283 | MJ/year | 5,520 | 232.02 | 2,000 | $57 | $0.24 | 4,086.96 |
| | | | | **92,381** | **5,287** | **947,447** | **$26,893** | **$5.09** | **196.60** |

## ANNEX J: PRELIMINARY GENDER ANALYSIS

### Preliminary gender analysis on Thailand

Brief assessment of the overall gender context of ***Thailand*** has been conducted by answering the following questions:

- → **What is the context?** (e.g. legal status, educational levels, gender norms & values, common beliefs & perceptions)
- → **Who does what?** (e.g. division of labour)
- → **Who has what?** (Equal access to resources such as credit, technologies, information, services, education: wage gaps; access to and control over energy?); esp. Financial capital, Human capital, Social capital, Physical capital
- → **Who decides?** (Who participates in decision-making at HH, public sector, private sector, politics, energy sector, project levels? Are women's associations consulted?)
- → **Who benefits?**

### COUNTRY CONTEXT

The analysis of the COUNTRY CONTEXT in **Thailand** shows several gender inequalities.

***Summary:*** The 1997 Constitution provides women and men in Thailand with ***equal rights***. Nevertheless, gender ***inequality*** is manifest in ***violence against women***, ***discrimination*** and human ***trafficking*** for prostitution. Women make up just over 40***% of the Thai labour force*** and employers are required to provide them the ***same wages*** and ***benefits*** as men. Despite the fact that more girls are now going to school and more than half of the country's university graduates are female, women are still confined to ***traditional roles***, have fewer opportunities than men for career advancement opportunities and ***are still concentrated in low-paying jobs***. Women are also very under-represented in electoral politics, though the ***National Women's Development Plan*** has set ambitious targets to tackle these issues. There are still problems of inequality and domestic violence. Stereotypical attitudes tend to limit perceptions of women's physical and psychological abilities and restrict the range of jobs that women enter into. Police and military academies, for example, do not accept female students. ***Data*** on gender issues is also quite ***limited***. Thailand will need to gather much more sex-disaggregated data to ensure that all plans, policies and programmes address their differential impacts on men and women.

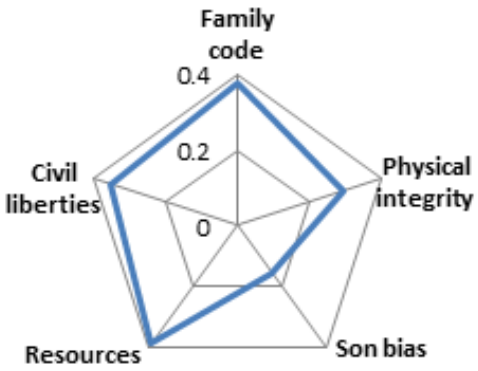



**Figure 1: Thailand's Performance in the SIGI 2014**[17]

[17] OECD 2014; Social Institutions & Gender Index, http://genderindex.org/country

**Rankings/ Indices**

- In the 2013 the Gender Inequality Index (**GII)** listed **Thailand** 89 out of 187[18].
- The Wold Economic Forum ranks Thailand 61 out of 142 countries in the **Global Gender Gap Report 2014**.[19]
- Thailand is ranked 37 out of 160 in the 2014 **Social Institutions and Gender Index (SIGI)**.[20]

Some more facts include:[21]

Human Development Report[22]

- Gender Inequality Index 0.364
- Maternal mortality ratio (deaths per 100,000 live births) 48
- Adolescent birth rate (births per 1,000 women aged 15-19) 41.004
- Share of seats in parliament (% held by women) 15.716
- Population with at least some secondary education, female (% aged 25 and above) 35.67
- Population with at least some secondary education, male (% aged 25 and above) 40.78
- Labour force participation rate, female (% of ages 15 and older) 64.4
- Labour force participation rate, male (% of ages 15 and older) 80.8
- Gender-related development index: female to male ratio of HDI 0.99
- HDI, female 0.718
- HDI, male 0.725

UN Women[23]

- Number of women for every 100 men in poorest households 93
- Percentage of women with no education 12.0
- Percentage of women with only primary education 77.0
- Percentage of women with secondary or higher education 11.0
- Percentage of women in Engineering, Manufacturing and Construction (2006-2013) was 4.2 as opposed to the percentage of men which was 17.1
- Minimum length of paid maternity leave 13 weeks; Minimum length of paternity leave 0

Gender CC[24]

- Gender pay gap is 30%

World bank[25]

- Percentage of male employment in industry in 2012 was 23% as opposed to 18% of women

**Historic Development of Gender in Society:** Thailand is a developing country located in Southeast Asia. Over the course of the past few decades, it has been going through various transformations. Previously, the country was known for its ***mistreatment of women***. In the ***new constitution*** that was written in 1997, women were granted equality with men. However, despite the new legislation, discrimination is still present and apparent in the role women play in government (***highly under-represented***), at home (***mistreated***) and at work (***discriminated***). Additionally, ***sex trafficking*** is still a prevalent problem among women and children. Sex trafficking became extremely prevalent in

[18] Gender Inequality Index: A composite measure reflecting inequality in achievements between women and men in three dimensions: reproductive health, empowerment and the labour market. See Technical note 3 at http://hdr.undp.org for details on how the Gender Inequality Index is calculated. Source: HDRO calculations based on data from UN Maternal Mortality Estimation Group (2013), UNDESA (2013a),IPU (2013), Barro and Lee (2013), UNESCO Institute for Statistics (2013) and ILO (2013a). (http://hdr.undp.org/en/content/gender-inequality-index)
[19] The Global Gender Gap Report 2014, World Economic Forum
[20] OECD 2014; Social Institutions & Gender Index, http://genderindex.org
[21] UNDP 2014 Human Development Statistical Tables, http://hdr.undp.org/en/countries/profiles
[22] UNDP 2014 Human Development Statistical Tables, http://hdr.undp.org/en/countries/profiles
[23] http://progress.unwomen.org/en/2015/pdf/UNW_progressreport.pdf
[24] http://www.gendercc.net/fileadmin/inhalte/Dokumente/Tools/toolkit-gender-cc-web.pdf
[25] http://data.worldbank.org/indicator/SL.IND.EMPL.FE.ZS/countries

Thailand during the time of the Vietnam War and has remained a commercial industry ever since in Thailand. In traditional Thai society, women play a very important role in the household as well as in commercial areas, but when it comes to planning, it is the men who make decisions.[26] Despite some progress, Thailand has a long way to go before reaching gender equality.

**Migration:** There are an estimated 2.5 million migrant workers living and working in Thailand. The majority comes from Burma but migrant workers also come from Cambodia and Lao PDR. Around ***50% of all migrants are women***. Migrant women workers are employed in textile and garment factories, domestic work, construction, entertainment and service industries, rubber plantations and fruit orchards as well the fishing industry, sorting fish on the port or in seafood processing factories.

**Family code:** Legislation in Thailand grants women a fairly high level of protection within the family context. The legal age for marriage is 17 years for both men and women, and individuals normally marry their partner of choice. With regards to early marriage, a 2004 United Nations report estimated that 15% of girls between 15 and 19 years of age were married, divorced or widowed. Polygamy was common among the country's elite in the past but is now rare: modern cases involve wealthy men who sometimes have a de facto second wife, known as the "minor wife". Family Law does not outlaw polygamy, but according to a report published by the CEDAW Committee, a man who engages in a second marriage is considered to have committed perjury, and can be fined or imprisoned for up to six months. Women have equal legal rights to exercise parental authority in the family, but traditionally men are seen as the head of the household. In the event of divorce in which the parents cannot agree upon custody rights, it is quite common for judges to grant custody to fathers.

Thai law does not distinguish between men and women with regards to inheritance. According to a CEDAW Committee report, the right to inheritance is instead attributed in the following order: i) descendants; ii) parents; iii) siblings who share the same father and mother; iv) siblings who share one parent; v) paternal and maternal grandparents; and vi) aunts and uncles. The youngest daughter of a family is often expected to care for the parents in their old age, in which case she usually inherits the family home.[27]

**Physical integrity:** Legal frameworks in Thailand provide women with a high degree of protection for their physical integrity, but problems remain. Violence against women is a criminal offense, with penalties depending on the age of the victim, the type of assault, and the physical and mental condition of the victim after the assault. However, the social perception is that violence against women is a private matter. Many incidents remain unreported and reliable statistics on domestic violence are difficult to obtain. Rape is illegal in Thailand, but the law does not address the issue of spousal rape. Human trafficking and the commercial sex trade is also a significant problem in Thailand. Female genital mutilation is not practised in Thailand, and there is no evidence to suggest it is a country of concern in relation to missing women. [28]

**Ownership rights:** In theory, women in Thailand have the same legal access to land as men. However, the law allows that ***only the head of the household may acquire land*** and the Ministry of Interior routinely registers ***men as the heads of households***. This negatively affects women's ability to obtain land in their own names. Women and men also have equal access to property other than land. Conjugal property is either managed jointly or by one spouse who has been given consent to do so by the other spouse. A CEDAW Committee report states that if either spouse enters into any legal contract independently or without the consent of the other spouse, the latter may apply to a court to have the contract revoked. Women in Thailand have access to bank loans and other forms of credit. [29]

**Civil liberties:** Laws and customs in Thailand support a high degree of civil liberty for women: there are no legal restrictions to their freedom of movement or freedom of dress. [30] Abortion is illegal in Thailand, except in special circumstances of rape or when the life of the mother is in danger.[31]

[26] http://www.snap-undp.org/elibrary/Publications/GenderAndClimateChange.pdf
[27] 2010 OECD, Atlas of Gender and Development, www.oecd-ilibrary.org/atlas-of-gender-and-development
[28] 2010 OECD, Atlas of Gender and Development, www.oecd-ilibrary.org/atlas-of-gender-and-development
[29] 2010 OECD, Atlas of Gender and Development, www.oecd-ilibrary.org/atlas-of-gender-and-development
[30] 2010 OECD, Atlas of Gender and Development, www.oecd-ilibrary.org/atlas-of-gender-and-development
[31] http://www.adb.org/sites/default/files/linked-documents/cps-tha-2013-2016-ga.pdf

**Institutional and Legal Frameworks:** The 2007 Constitution guarantees equality between men and women and prohibits discrimination on multiple grounds, including on the basis of sex (Article 30 of the Constitution of the Kingdom of Thailand). Legislative amendments have been made to improve women's ability to claim their rights. In 2005, the Name Act was amended to allow women the right to choose a family name. In 2007, the Penal Code was amended to criminalize marital rape, and the Civil Code amended to provide women and men equal grounds for divorce. The Protection of Victims of Domestic Violence Act, passed in 2007, provides for protection and rehabilitation of victims, requiring members of the public to report alleged abuse, and obliging law enforcement officers to respond to reports of violence. The Prevention and Suppression of Human Trafficking Act was passed in 2008. Thailand ratified the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) in 1985, and the Optional Protocol in 2009.[32]

Thailand, with support from WIEGO and other partners, campaigned for more than a decade to win legislative protection for homeworkers. Both the Homeworkers Protection Act B.E.2553 and a social protection policy came into force in May 2011. The law mandates fair wages –including equal pay for men and women doing the same job – be paid to workers who complete work at home for an industrial enterprise.[33]

**Health:**[34] The maternal mortality ratio (MMR) has steadily declined from 110 per 100,000 live births in 2005 to 48 per 100,000 in 2010. The leading causes of maternal deaths are hemorrhage, sepsis and embolism, unsafe abortion, malaria, and HIV/AIDS. Thailand continues to experience the highest HIV infection rate in Southeast Asia and the second highest in Asia, after the People's Republic of China. Intimate partner transmission of HIV is approximately 36%. Women report limited power to negotiate safe sex, with the main reason for not using a condom being refusal by men. The nature of their work (sex work, street begging, working in factories), together with limited access to information, HIV prevention, care, and treatment services, increase their vulnerability to HIV infection.

## SECTOR CONTEXT

*The analysis of the sector context in **Thailand** shows gender inequalities.*

**Economy:** Thailand is a middle-income country that over the past 20 years has seen remarkable progress in human development moving from a Human Development Index of 0.678 in 1985 to 0.722 in 2013, and will achieve most if not all of the global Millennium Development Goals well in advance of 2015. Thailand's progress can be attributed to a mix of astute policy making, stronger democratic governance, the industriousness of Thai people, public investment in social services, advantageous historic and geopolitical circumstances and, not least, economic growth. Thailand's rapid economic growth has contributed to a significant overall decline in poverty. However, not everyone has benefited from economic growth or from government programmes, some regions and vulnerable groups have been left behind and the gaps are widening. Most of Thailand's people living in ***poverty*** reside in the ***rural areas*** and work in ***agriculture***, though there are also one million people who are poor in the urban areas. A number of marginalized and vulnerable groups, in particular, are likely to be poor and not to be equitably reached by social services and protection measures. These include ***children*** in the North-east, the North and the deep South, where more than one million of them also suffer from ***malnutrition***. Another group of rural poor are persons with disabilities.

**Informal sector:** In 2007, Thailand's National Statistic Office reported that a total of 37.1 million workers are employed and that 23.3 million are informal workers, including those working in the agricultural sector. ***Informal workers*** make up ***62.7%*** of overall workers, compared with 37.3% in the formal sector. There has been an increase of 700 000 informal workers between 2005 and 2007. In Thailand, ***women*** make up ***76.7% of homeworkers***, compared with 23.3% men. ***Women make up the majority of informal workers*** because jobs are flexible and the skills requirements are low. Uneducated women or women with low levels of education combine work in the informal economy with household work. Women workers in the informal economy are in ***extremely vulnerable situations***, with no protection through labour laws, no effective policy measures to address their situations, and lack of access to social security systems. This results in poor working conditions and insecure employment. These women may face social and economic violence because of the invisibility of the informal sector. Poor economic conditions limit their potential to access private social security systems, including health care. As a result, these women face ill-health and poor quality of

[32] http://www.adb.org/sites/default/files/linked-documents/cps-tha-2013-2016-ga.pdf
[33] http://wiego.org/informal-economy/occupational-groups/garment-workers
[34] http://www.adb.org/sites/default/files/linked-documents/cps-tha-2013-2016-ga.pdf

life. Women home-based workers are poor and do not have the collateral or income statements needed to access capital from commercial or state-owned banks. Some attempts have been made to initiate and organize community-based micro credit schemes, but these efforts are still limited in scope and insufficient in relation to the existing needs. The available micro-credit schemes are primary focused on meeting emergency needs rather than on more long-term small business development.

In Thailand, the garment industry is the largest export industry, accounting for 60 per cent of total exports (NSO 2012). A survey by the National Statistics Office found that, among subcontracted workers, about half of non-agricultural home-based employment was related to garments and textiles (NSO 2007). Thailand's Office of Homeworker Protection (OHWP) estimated there were over 950,000 homeworkers in 2005, the majority women.[35]

**Energy:** Female household heads have greater likelihood of participation in contract farming under cooperatives than male household heads. Women contractors of cassava in Thailand have a large farm size worked completely by local hired machinery and labour. The husbands support the women in various ways in order to obtain influence in decisions regarding the cassava process. The women also grow cassava together with their husbands on their family farms and this cassava production is completely controlled by both women and their husbands.[36]

In Thailand, growing cassava is usually carried out by both men and women. The harvest uses female labour mainly for pulling up plants and cutting-off roots, while male labour is used for pulling up plants and loading of trucks.[37]

Over 92% of the households surveyed in Thailand have access to grid electricity leading to lower usage of kerosene lamps and battery torches.[38]

A study shows that energy decisions related to electrical appliances in MECON[39] households are made by man as well as woman. Men dominate in Cambodia, Laos and Vietnam while women dominate in Thailand.[40]

**SMEs:** ***Entrepreneurship development programmes for women*** in the informal sector are ***not widely available***. ***Training programmes*** related to the needs of women and/or training which incorporates ***gender sensitivity*** are very ***rare***. Training programmes often do not take into account the constraints faced by these women who have ***low levels of education***, ***limited time*** and ***huge work burdens***. As a result, these women are blocked from self-development opportunities and unable to improve and upgrade their capacities. Women therefore have limited potential to increase the efficiency of their businesses and are unable to make the shift from sub-contracted workers to own-account workers.

**Manufacturing:** The women working in garment factories in Mae Sot received only 69 baht a day (£1.40) for a 10 or 11 hour working day. Yet the legal minimum wage in Mae Sot at the time of the interviews was 153 baht (£3.10) a day. In one factory where the workers were employed to do piece work they were paid 20 baht (40p) for 100 pieces. Overtime was paid at 15 baht (30p) for two hours' work, or for those who were experienced 11 baht (22p) per hour. So in busy times with overtime, the workers said that they may get 100 baht per day (roughly £2.00), still far below the minimum wage. In addition, according to the women interviewed, wages are rarely paid on time. When the workers produced for Western brands, there were strict limits on working hours: a normal eight hour day and no more than four hours' overtime. However, as a result the workers were under heavy pressure to produce more garments. Only workers in factories producing for Western brand names earned the legal minimum wage. Employment contracts are often non-existent for migrant women workers in Thailand's garment industry. Women workers producing goods for Western brands had signed contracts, but they were not given a copy of their contracts, nor were they informed of the company's code of conduct. Women working for non-Western brands had no employment contract or regulation of their working conditions.

[35] http://wiego.org/informal-economy/occupational-groups/garment-workers
[36] http://ifrnd.org/Research%20Papers/S69.pdf
[37] http://www.fao.org/3/a-y1177e/Y1177E04.htm
[38] http://www.see2014.com/UserFiles/File/Full%20paper%20for%20website/D-006.pdf
[39] Modern Energy CONsumers (MECON), defined as those who has access to electricity but still poor with an income range of 2-5$/person/day in the Greater Mekong Sub-region (GMS) countries, namely Cambodia, Myanmar, Laos, Thailand and Vietnam
[40] http://www.see2014.com/UserFiles/File/Full%20paper%20for%20website/D-006.pdf

**STAKEHOLDER CONTEXT**

Further research will consider, but will not be limited to, the following stakeholders regarding their involvement and position towards GEEW, such as existing gender policies and balance:

- **UNIDO**: Project team is gender sensitized through UNIDO internal staff trainings; UNIDO Gender Policy 2009
- **GEF**: Gender Mainstreaming Policy; GEF Gender Equality Action Plan

The following women's associations will be used as basis for further research on stakeholders and will be considered for inclusion in stakeholder consultations during project implementation:

- Palang Thai: NPO based in Thailand that works in the context of energy supply and promotes social justice and sustainability of projects in the energy sector
- Friends of Asia: Projects for the Empowerment of Women; Women in the developing world face similar challenge. These challenges can be overcome by equipping disadvantaged women in Asia with the skills and confidence they need to turn their lives around. The help of volunteers is essential in freeing the women to focus on this personal development.[41]
- Women's Education for Advancement and Empowerment; www.weave-women.org/

Key gender dimensions of the project outcomes and outputs as well as potential gender-relevant indicators are provided in the table below:

**Table 1: Potential Gender Dimensions**

| Project Component | Gender Dimensions |
|---|---|
| **Objective of the project:** To promote and support adoption of energy efficient practices and technologies in selected Small and Medium Enterprises (SMEs) in Thailand for improved competitiveness and a greening of industry. | • Promote the adde d-value from gender balanced teams and gender-sensitive recruitment –whenever possible.<br>• Ensure that data is collected in a sex-disaggregated manner whenever possible and can also be used for evaluation.<br>• Ensure that gender dimensions are considered across all project activities – whenever feasible.<br>• Potential gender-relevant targets and indicators<br>→ Data collection is done in a gender-disaggregated manner (y/n)<br>→ % of women and men working in the project team<br>→ % of female/ male beneficiaries |
| **Component 1: Policy enhancement for the promotion of low-carbon technologies within Thai SMEs** | |
| Outcome 1.1: Enhanced policy and regulatory frameworks and increased awareness support the adoption of low-carbon technologies within SMEs<br>Output 1.1.1 Policy and regulatory frameworks enhanced for the promotion of energy efficiency and supporting technologies / systems for SMEs. | • Encourage inclusion of gender dimensions during **policy review** and formulation of e.g. new strategies to promote adoption of energy efficient and innovative low-carbon technologies.<br>• Consider gender-specific needs and impacts that will be relevant to ensure that both men and women will have the same opportunities offered by the improved policies and guidelines).<br>• Make efforts to secure ***gender balance*** of the participants in consultative meetings.<br>• Potential gender-relevant targets and indicators<br>→ Gender dimension included in the policy review and formulation. (y/n)<br>→ Incentive mechanisms, policy reviews and formulations contain sex-disaggregated data (y/n/#/%). |

[41] http://www.friendsforasia.org/projects-for-the-empowerment-of-women/

| Project Component | Gender Dimensions |
|---|---|
| Output 1.1.2: Awareness campaign promoting low-carbon technologies for SMEs | • Make efforts to secure ***gender balance, at least 10% of women in each target group,*** (also consider ethnicity and age, if applicable) of the participants in trainings, campaigns and workshops as well as local and international trainers and technical consultants[42]. Pay attention to establish a valid baseline for the target groups. This is needed to define realistic and gender sensitive targets.<br>→ Promote participation of qualified women in in trainings, campaigns and workshops and all project activities (e.g. outreach[43]/ promotion through women's engineering associations, use of gender-responsive languages, etc.).<br>→ Address conditions that may prevent women participation in the in trainings, campaigns and workshops such as security, knowledge gap and resources when possible (e.g. through scholarships, reduced fee, specialized courses, safe transport).<br>→ Raise awareness of local institutions that UNIDO promotes GEEW and therefore UNIDO encourages to select both female and male representatives to participate in all organized in trainings, study tours and awareness raising workshops.<br>• Consider the integration of gender aspects in the ***content/ curriculum of all*** trainings, campaigns and workshops (e.g. indicating information in a sex-disaggregated manner, separate session on gender dimensions).<br>• Ensure that all capacity building activities, training ***materials*** and campaigns are gender-responsive. For instance, pay attention to gender neutral language, include gender-disaggregated data whenever possible, make sure to reach both women and men, etc.<br>• Potential gender-relevant targets and indicators<br>→ #/% of female/male participants (disaggregated by age) in trainings, campaigns and workshops per target group<br>→ CSOs and NGOs focusing on GEEW or gender expert as consulted |
| Output 1.1.3: Financing schemes for the adoption of low-carbon technologies by SMEs facilitated and promoted | • Consider gender-specific needs and impacts that will be relevant to ensure that both men and women will have the same opportunities offered by the improved policies and guidelines).<br>• Consider gender-specific needs and impacts that will be relevant to ensure that both men and women will have the same opportunities offered by the improved policies and guidelines).<br>• Make efforts to secure ***gender balance*** of the participants in consultative meetings.<br>• Potential gender-relevant targets and indicators<br>→ Gender dimension included in the formulation of the reader-friendly package. (y/n) |
| **Component 2: Capacity building and implementation of low-carbon technologies in SMEs** | |
| Outcome 2.1: Improved capacity and knowledge management supports the improvement of energy | • Include section on gender dimensions in the training needs assessments (TNAs) of the trainings and workshops (if a TNA will be conducted).<br>• Make efforts to secure ***gender balance, at least 10% of women in each target*** |

[42] Participation in training courses should be gender balanced, i.e. targeting at having at least 40% of participants of the underrepresented sex. As the local energy sector is characterized by strong male domination, the optimal participation of 40% does not seem feasible. A gender analysis will be necessary to provide reliable information for defining a baseline. This will allow setting realistic targets for female participation. For example, it is necessary to know the number of female graduates in electrical/mechanical engineering if a capacity building activity is conducted for electrical/mechanical engineers. If not enough female graduates are available it could be considered to make an additional course to upgrade skills of female students or graduates from other areas to allow them to participate.

[43] Regarding the specific outreach efforts it would be suggested to work together with relevant stakeholder such as women´s groups or NGOs. For this it would be suggested to conduct a stakeholder analysis in the framework of the gender analysis.

| Project Component | Gender Dimensions |
|---|---|
| efficiency in SMEs<br><br>Output 2.1.1: Technical capacity building on low-carbon technologies and EnMS of local technical experts, equipment and service providers, and industry<br><br>Output 2.1.2: An Online Information and Learning Platform (I&LP) on low-carbon technologies established and dissemination materials developed | ***group,*** (also consider ethnicity and age, if applicable) of the participants in trainings, campaigns and workshops as well as local and international trainers and technical consultants[44].<br>→ Promote participation of qualified women in trainings, campaigns and workshops and all project activities (e.g. outreach[45]/promotion through women's engineering associations, use of gender-responsive languages, etc.).<br>→ Address conditions that may prevent women participation in the in trainings, campaigns and workshops such as security, knowledge gap and resources when possible (e.g. through scholarships, reduced fee, specialized courses, safe transport).<br>→ Raise awareness of local institutions that UNIDO promotes GEEW and therefore UNIDO encourages to select both female and male representatives to participate in all organized in trainings, study tours and awareness raising workshops.<br>• Consider the integration of gender aspects in the ***content/ curriculum of all*** trainings, campaigns and workshops (e.g. indicating information in a sex-disaggregated manner, separate session on gender dimensions).<br>• Ensure that all capacity building activities, training ***materials*** and campaigns are gender-responsive. For instance, pay attention to gender neutral language, include gender-disaggregated data whenever possible, make sure to reach both women and men, etc.<br>• Potential gender-relevant targets and indicators<br>→ #/% of female/male participants (disaggregated by age) in trainings, campaigns and workshops per target group<br>→ #/% of learning material (e.g. awareness raising sessions) includes gender dimensions<br>→ CSOs and NGOs focusing on GEEW or gender expert as consulted<br>→ #/% female trainers |
| Outcome 2.2: Increased competitiveness of selected SMEs as a result of increased adoption of low-carbon technologies and improved operating practices<br><br>Output 2.2.1: Implementation of low-carbon technologies and EnMS in SMEs | • Ensure inclusion of gender dimension in the business plans and feasibility studies, supportive studies and technical designs, e.g. **environmental and social impact assessments (ESIAs)**. In addition, collect sex-disaggregated data and information on potential beneficiaries (e.g. female-led SMEs) during ESIAs and energy demand assessment for site selection.<br>• Promote that women and men are given **equal opportunity to access, participate in, benefit from & decide over** the implementation projects.<br>→ For instance, include considerations to identify opportunities to involve women as owners or developers of SMEs when all other conditions are similarly satisfied.<br>→ When selecting the demonstration site consider female-led SMEs as beneficiaries when all other conditions are similarly satisfied.<br>→ Consider the inclusion of qualified women in the design and development of the low-carbon technologies. |

[44] Participation in training courses should be gender balanced, i.e. targeting at having at least 40% of participants of the underrepresented sex. As the local energy sector is characterized by strong male domination, the optimal participation of 40% does not seem feasible. A gender analysis will be necessary to provide reliable information for defining a baseline. This will allow setting realistic targets for female participation. For example, it is necessary to know the number of female graduates in electrical/mechanical engineering if a capacity building activity is conducted for electrical/mechanical engineers. If not enough female graduates are available it could be considered to make an additional course to upgrade skills of female students or graduates from other areas to allow them to participate.

[45] Regarding the specific outreach efforts it would be suggested to work together with relevant stakeholder such as women´s groups or NGOs. For this it would be suggested to conduct a stakeholder analysis in the framework of the gender analysis.

| Project Component | Gender Dimensions |
|---|---|
| | • Potential gender-relevant targets and indicators<br>→ Business plans, feasibility studies, supportive studies, incentive mechanism and technical designs contain sex-disaggregated data (y/n/#/%).<br>→ #/% of female-led SMEs as beneficiaries<br>→ #% of female employees at SMEs that undertake implementation projects |

**ANNEX K: PROJECT BUDGET**

**Output Based Budget for the GEF Grant**

| | | GEF Grant Budget Component 1 | | | | |
|---|---|---|---|---|---|---|
| **Component 1 – Policy analysis and improvement for the promotion of low-carbon technologies within Thai SMEs** | **Type of Expense** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Output Total** |
| *Output 1.1.1 – Policy Gap and Barrier Analysis conducted, and key policy recommendations proposed to Thai policy-makers* | International Expertise | | | | | 0 |
| | Local Travel | 500 | 500 | 500 | | 1,500 |
| | National Expertise | 10,000 | 10,000 | 5,000 | | 25,000 |
| | Contractual Arrangement | 4,000 | 8,000 | 5,000 | | 17,000 |
| | Training/Workshops | 2,500 | 5,000 | 2,500 | | 10,000 |
| | International Meetings/Workshops | | | | | 0 |
| | Equipment | | | | | 0 |
| | Miscellaneous | | | | | 0 |
| | ***Output sub-total*** | **17,000** | **23,500** | **13,000** | **0** | **53,500** |
| *Output 1.1.2 - Awareness campaign promoting low-carbon technologies for SMEs* | International Expertise | | | | | 0 |
| | Local Travel | 1,500 | 1,500 | | | 3,000 |
| | National Expertise | 15,000 | 15,000 | | | 30,000 |
| | Contractual Arrangement | 20,000 | 20,000 | | | 40,000 |
| | Training/Workshops | 15,000 | 15,000 | | | 30,000 |
| | International Meetings/Workshops | | | | | 0 |
| | Equipment | | | | | 0 |
| | Miscellaneous | | | | | 0 |
| | ***Output sub-total*** | **51,500** | **51,500** | **0** | **0** | **103,000** |
| *Output 1.1.3 - Financing schemes for the adoption of low-carbon technologies by SMEs facilitated and promoted* | International Expertise | | | | | 0 |
| | Local Travel | | 750 | 750 | | 1,500 |
| | National Expertise | | 12,000 | 12,000 | | 24,000 |
| | Contractual Arrangement | | 5,000 | 5,000 | | 10,000 |
| | Training/Workshops | | 4,000 | 4,000 | | 8,000 |
| | International Meetings/Workshops | | | | | 0 |
| | Equipment | | | | | 0 |
| | Miscellaneous | | | | | 0 |
| | ***Output sub-total*** | **0** | **21,750** | **21,750** | **0** | **43,500** |
| | **TOTAL Component 1** | **68,500** | **96,750** | **34,750** | **0** | **200,000** |

| | | GEF Grant Budget Component 2 | | | | |
|---|---|---|---|---|---|---|
| **Component 2 - Capacity building and implementation of low-carbon technologies in SMEs** | **Type of Expense** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Output Total** |
| *Output 2.1.1 - Technical capacity building on low-carbon technologies and EnMS of local technical experts, equipment and service providers, and industry* | International Expertise | 37,000 | 16,000 | | | 53,000 |
| | Local Travel | 5,000 | 5,000 | 5,000 | 3,000 | 18,000 |
| | National Expertise | 25,000 | 25,000 | 20,000 | 15,000 | 85,000 |
| | Contractual Arrangement | 45,000 | 85,000 | 100,000 | 36,000 | 266,000 |
| | Training/Workshops | 15,000 | 30,000 | 35,000 | 15,000 | 95,000 |
| | International Meetings/Workshops | | | | | 0 |
| | Equipment | 10,000 | 10,000 | | | 20,000 |
| | Miscellaneous | 5,000 | 5,000 | 5,000 | | 15,000 |
| | ***Output sub-total*** | **142,000** | **176,000** | **165,000** | **69,000** | **552,000** |
| *Output 2.1.2 – An Online Information and Learning Platform (I&LP) on low-carbon technologies established and dissemination materials developed* | International Expertise | | | | | 0 |
| | Local Travel | 1,000 | 2,000 | 1,000 | | 4,000 |
| | National Expertise | 5,000 | 10,000 | 5,000 | | 20,000 |
| | Contractual Arrangement | 10,000 | 60,000 | 10,000 | | 80,000 |
| | Training/Workshops | | 10,000 | 10,000 | | 20,000 |
| | International Meetings/Workshops | | | | | 0 |
| | Equipment | | | | | 0 |
| | Miscellaneous | | 2,000 | 2,000 | 2,000 | 6,000 |
| | ***Output sub-total*** | **16,000** | **84,000** | **28,000** | **2,000** | **130,000** |
| *Output 2.2.1 - Implementation of low-carbon technologies and EnMS in SMEs* | International Expertise | 10,000 | 44,000 | 49,000 | 21,000 | 124,000 |
| | Local Travel | | 5,000 | 8,000 | 2,000 | 15,000 |
| | National Expertise | | 20,000 | 26,000 | 10,000 | 56,000 |
| | Contractual Arrangement | | 160,000 | 220,000 | 89,000 | 469,000 |
| | Training/Workshops | | 30,000 | 35,000 | 15,000 | 80,000 |
| | International Meetings/Workshops | | | | | 0 |
| | Equipment | | 5,000 | 5,000 | | 10,000 |
| | Miscellaneous | | 10,000 | 10,000 | 10,000 | 30,000 |
| | ***Output sub-total*** | **10,000** | **274,000** | **353,000** | **147,000** | **784,000** |
| | **TOTAL Component 2** | **168,000** | **534,000** | **546,000** | **218,000** | **1,466,000** |

| | | GEF Grant Budget Project Cost | | | | |
|---|---|---|---|---|---|---|
| **Project Costs** | **Type of Expense** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Output Total** |
| *Monitoring & Evaluation* | International Expertise | | | | 23,000 | 23,000 |
| | Local Travel | | | | 2,000 | 2,000 |
| | National Expertise | | | | 5,000 | 5,000 |
| | Contractual Arrangement | 2,250 | 2,250 | 2,250 | 7,250 | 14,000 |
| | Training/Workshops | 6,000 | | | | 6,000 |
| | International Meetings/Workshops | | | | | 0 |
| | Equipment | | | | | 0 |
| | Miscellaneous | | | | | 0 |
| | ***Output sub-total*** | **8,250** | **2,250** | **2,250** | **37,250** | **50,000** |
| *Project Management Cost (PMC)* | International Expertise | | | | | 0 |
| | Local Travel | 4,000 | 5,000 | 5,000 | 3,000 | 17,000 |
| | National Expertise | 30,000 | 30,000 | 30,000 | 15,000 | 105,000 |
| | Contractual Arrangement | | | | | 0 |
| | Training/Workshops | | | | | 0 |
| | International Meetings/Workshops | | | | | 0 |
| | Equipment | 15,000 | 10,000 | | | 25,000 |
| | Miscellaneous | 4,000 | 5,000 | 5,000 | 3,000 | 17,000 |
| | ***Output sub-total*** | **53,000** | **50,000** | **40,000** | **21,000** | **164,000** |
| | **TOTAL Project Cost** | **61,250** | **52,250** | **42,250** | **58,250** | **214,000** |

| **Budget Line Summary** | | | | | |
|---|---|---|---|---|---|
| **Type of Expense** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **BL Total** |
| International Expertise | 47,000 | 60,000 | 49,000 | 44,000 | 200,000 |
| Local Travel | 12,000 | 19,750 | 20,250 | 10,000 | 62,000 |
| National Expertise | 85,000 | 122,000 | 98,000 | 45,000 | 350,000 |
| Contractual Arrangement | 81,250 | 340,250 | 342,250 | 132,250 | 896,000 |
| Training/Workshops | 38,500 | 94,000 | 86,500 | 30,000 | 249,000 |
| International Meetings/Workshops | 0 | 0 | 0 | 0 | 0 |
| Equipment | 25,000 | 25,000 | 5,000 | 0 | 55,000 |
| Miscellaneous | 9,000 | 22,000 | 22,000 | 15,000 | 68,000 |
| **TOTAL** | **297,750** | **683,000** | **623,000** | **276,250** | **1,880,000** |