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Independent UNIDO Country Evaluation

The Kingdom of Thailand



UNIDO INDEPENDENT EVALUATION DIVISION

Independent UNIDO Country Evaluation

The Kingdom of Thailand



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Abbreviations and acronyms

AEC	ASEAN Economic Community
AEDP	Alternative Energy Development Plan
APEC	Asia Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
BAT	Best available Technique
BOI	Board of Investment
CCM	Climate Change Mitigation
CE	Creative Economy
CEO	Chief Executive Officer
CFP	Carbon Footprint
CMU	Chiang Mai University
CP	Cleaner production
CSR	Corporate Social Responsibility
CTP	CT Power Engineering Company
DEDE	Department of Alternate Energy and Energy Efficiency
DIP	Department of Industrial Promotion
DIW	Department of Industrial Works
DOI	Department of Industry
DSS	Department of Science Services
EC	European Commission
EE	Energy Efficiency
EGAT	Electricity Generating Authority of Thailand
EnMS	Energy Management System
EPPO	Energy Planning and Policy Office
ESEA	East and South East Asia
EU	European Union
FAO	Food and Agricultural Organization
FIO	Forest Industry Organization
FSP	Full-Scale project
FY	Financial Year

GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gases
GHI	Green and Happiness Index
GII	Green Industry Initiative
GIPO	Green Energy Promotion and Development Office
GMS	Greater Mekong Sub-Region
HDI	Human Development Index
HQ	Head Quarters
ILAC	International Laboratory Accreditation Cooperation
INC	International Negotiation Committee
ISID	Inclusive and Sustainable Industrial Development
ISMED	Institute for Small and Medium Enterprise Development
ISO	International Organization for Standardization
ISO17025	ISO Standard for Calibration and Testing Laboratories
ITAP	Industrial Technology Assistance Program
LDC	Less Developing Countries
LFA	Logical Framework Analysis
LMV	Lao PDR, Myanmar and Vietnam
LPG	Liquefied Petroleum Gas
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MIC	Middle Income Country
MNRE	Ministry of Natural Resources and Environment
MOC	Ministry of Commerce
MOE	Ministry of Energy
MOI	Ministry of Industry or Ministry of Interior
MOPH	Ministry of Public Health
MRA	Mutual Recognition Arrangement
MSP	Medium-Size Project
MSW	Municipal Solid Waste
MTR	Mid-Term Review

NASTDA	National Science and Technology Development Agency
NCPC	National Cleaner Production Centre
NESDP	National Economic and Social Development Plan
NGO	Non-Governmental Organization
NIC	Newly Industrializing Countries
NIP	National Implementation Plan
NPC	National Project Coordinator
NPM	National Project Manager
O&M	Operation and Maintenance
ODG/EVA	Office for Independent Evaluation
OIE	Office of Industrial Economics
OSMEP	Office of Small and Medium Enterprises Promotion
PAB	Programme Advisory Board
PCB	Polychlorinated Biphenyls
PCD	Pollution Control Department
PCDD	Polychlorinated Dibenzodioxins
PCDF	Dibenzofurans
PEA	Provincial Electricity Authority
PMO	Project Management Office
PMU	Project (or Provincial) Management Unit
POPs	Persistent Organic Pollutants
PPG	Project Preparation Grant
PRF	Project Results Framework
PSC	Project Steering Committee
R&D	Research and Development
RE	Renewable Energy
REACH	Registration, Evaluation, Authorization and Restriction of Chemicals
RECP	Resource Efficiency and Cleaner Production
RET	Renewable Energy Technology
RO	Regional Office
RTG	Royal Thai Government
SAP	System Applications and Products

SC	Stockholm Convention
SDG	Sustainable Development Goal
SMART	Specific, Measurable, Achievable, Relevant and Time-bound
SME	Small and Medium Enterprise
SO	System Optimization
STAP	Scientific and Technical Advisory Panel (of GEF)
STRI	Science and Technology Research Institute
SVHC	Substance of Very High Concern
TCB	Trade Capacity Building
TEQ	Toxic Equivalent Quality
TFI	Thailand Food Institute
TICA	Thailand International Cooperation Agency
TISI	Thailand Industrial Standards Institute
TISTR	Thailand Institute of Science and Technological Research
TLAS	Thai Laboratory Accreditation Scheme
ToR	Terms of Reference
TT-Pilot	Technology Transfer Pilot
TTI	Thailand Textile Institute
UN	United Nations
UNCT	United Nations Country Team
UNIDO	United Nations Industrial Development Organization
UNJP	United Nations Joint Programme
UNPAF	United Nations Partnership Framework
UP-POPs	Unintentionally Produced POPs
UR	UNIDO Representative
VSP	Very Small Power producer

Glossary of evaluation-related terms

Term	Definition
Baseline	The situation, prior to an intervention, against which progress can be assessed.
Effect	Intended or unintended change due directly or indirectly to an intervention.
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved.
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.
Impact	Positive and negative, intended and non-intended, directly and indirectly, long term effects produced by a development intervention.
Indicator	Quantitative or qualitative factors that provide a means to measure the changes caused by an intervention.
Lessons learned	Generalizations based on evaluation experiences that abstract from the specific circumstances to broader situations.
Logframe (logical framework approach)	Management tool used to facilitate the planning, implementation and evaluation of an intervention. It involves identifying strategic elements (activities, outputs, outcome, impact) and their causal relationships, indicators, and assumptions that may affect success or failure. Based on RBM (results based management) principles.
Outcome	The likely or achieved (short-term and/or medium-term) effects of an intervention's outputs.
Outputs	The products, capital goods and services which result from an intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes.
Relevance	The extent to which the objectives of an intervention are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donor's policies.
Risks	Factors, normally outside the scope of an intervention, which may affect the achievement of an intervention's objectives.
Sustainability	The continuation of benefits from an intervention, after the development assistance has been completed.
Target groups	The specific individuals or organizations for whose benefit an intervention is undertaken.

Country map



Executive summary

Introduction

An independent evaluation of the activities and involvement of the United Nations Industrial Development Organization (UNIDO) in Thailand was included in the UNIDO Office for Independent Evaluation (ODG/EVA) Work Programme 2015.

The country evaluation assessed the efficiency, effectiveness, impact and sustainability of the UNIDO interventions in Thailand. The major focus of this first-ever country evaluation was the re-examination of the relevance of the objectives and the appropriateness of the design of projects, specifically in regards to inclusive and sustainable industrial development (ISID). Moreover, the country evaluation reviewed the management and coordination of UNIDO interventions in Thailand.

The country evaluation was conducted between November 2015 and May 2016, with field mission in Thailand in November 2015. The evaluation team was composed of Mr. Brahmanand Mohanty, Independent Senior International Evaluation Consultant and team leader, Ms. Tharee Kamuang, National Evaluation Consultant, and Mr. Javier Guarnizo, Senior Evaluation Officer, UNIDO.

UNIDO activities in Thailand

UNIDO has a long history of collaboration with Thailand. However, there has not been any recent specific framework for Thailand-UNIDO cooperation other than the wider UN Partnership Framework (UNPAF). During the period 2000-2008, majority of projects were of the preparatory assistance-type, and most UNIDO projects developed since 2008 are in areas of environment and energy, funded by Global Environment Facility (GEF). UNIDO works primarily with the Ministry of Industry (MOI) as its main counterpart, and also with the Ministry of Natural Resources and Environment (MNRE) and the Ministry of Energy (MOE).

UNIDO's current Regional Office in Thailand came into existence in February 2000. Other than Thailand, this office covers Cambodia, Lao People's Democratic Republic, Malaysia and Myanmar. It is headed by a UNIDO Representative (UR) supported by a team of 4 national staff.

The 11th National Economic and Social Development Plan (NESDP) of Thailand emphasizes human and social development towards a quality society, guiding the economy towards inclusive growth, and management of natural resources and the environment towards sustainability. The industrial sector focus is the creation of knowledge-based and eco-friendly industries with special attention to SMEs.

UNIDO's projects in Thailand are in line with the organization's Inclusive and Sustainable Industrial Development (ISID) Agenda and are designed to support Thailand's National Industrial Development Master Plan by:

- i. Strengthening the competitiveness of local firms;
- ii. Supporting government partners in building their capacities for better regional and international integration in the areas of production and supply chains; and
- iii. Enhancing the capacity of Thai Small and Medium Enterprises (SMEs) to adhere to environmental standards and practices, and more efficient use of resources and energy.

At the time of evaluation, the overall project portfolio in Thailand was of the order of US\$ 10 million and there are efforts to expand the project portfolios with GEF funding.

Key evaluation findings

UNIDO's past and on-going interventions in Thailand have taken Thailand's industrial priorities, strategies and needs, and the regional and global development agenda well into consideration. The on-going projects, all in the field of environment and energy under GEF portfolio, have been formally developed in consultation with and the involvement of appropriate ministerial counterparts. Many of the projects, however, appear to be UNIDO-driven, with weak ownership at the institutional level and limited engagement and participation during the project formulation and implementation phases. As a result, some of the potentially relevant stakeholders have not been engaged right from the start of the project. Moreover, some projects with limited budget and time frame have set ambitious targets and created unrealistic expectations.

Projects developed by UNIDO were found to be generally relevant in terms of both UNIDO's thematic priorities as well as Thailand's national priorities. Projects were designed to be technically sound, oriented towards fulfilling the planned activities and outputs, but not always ensuring the desired outcome and impact. Some projects have not secured the committed co-funding, thus leading to delays in implementation and compromising the outputs both in terms of quantity and quality. For some projects that have led to the desired outputs and to the successful implementation of pilot initiatives, sustainability and/or scale-up issues have not been given due consideration. As a result, one may expect little policy level changes beyond the life of the projects. Sub-optimal performance of project management units (PMUs) and unclear role of Project Steering Committee (PSC) have also been noted in some projects.

Specific findings for the individual projects are summarized below.

Poverty reduction through productive activities

The UN Joint Programme (UNJP) on “Integrated highland livelihood development in Mae Hong Son”, carried out from October 2009 to January 2014, sought to improve livelihood of the poor and vulnerable population in highlands of the province. It was an innovative development assistance effort of eight United Nations (UN) agencies, government offices and implementing partners in a well-coordinated and harmonized manner, aiming at creating synergies among the diverse stakeholders and maximizing the impacts on target beneficiaries.

However, the program design did not clearly set the overall outcome to be achieved at the end of the implementation phase. Moreover, the programme faced several challenges such as the complexity of implementation with a large number of partners, the relatively short execution time and modest budget. As a result, the scale of implementation of the programme was rather limited to have a wider impact on the development of the province.

The programme was efficient in reaching the target groups and communities, carrying out the planned activities and achieving the outputs. However, the programme’s effectiveness in achieving the outcome cannot be ascertained due to the lack of pertinent data such as quantification of productivity improvements, increase in income, improved nutritional and health status of the target groups, and capacity for environmental preservation.

Trade Capacity Building

UNIDO has completed two projects in the Trade Capacity Building Portfolio more or less during the same time period with financial support from the European Commission: (1) The project on “Upgrading of the Technical and Personnel Capacity of the Target Thai Chemical Testing Laboratories” was implemented from August 2008 to October 2010; (2) The project on “*Trade Capacity Building in Thailand through Strengthening the Capacities of Testing Laboratories for Food and Agricultural Products*” was implemented from December 2008 to October 2010.

Upgrading the technical and personnel capacity of the chemical-testing laboratories

During the present country evaluation, all beneficiaries showed their appreciation for the support received from UNIDO in order to train their staff, upgrade laboratory equipment and obtain international accreditation. All the beneficiaries were providing the required services to the Thai industries. However, no attempts were made to assess the impact of their activities on enhanced trade. Some beneficiaries

lamented the absence of further interaction with UNIDO since the completion of the project. They perceived UNIDO more as a “donor” than an agency that had the necessary expertise to provide technical assistance for trade capacity building.

Strengthen the capacities of testing laboratories for food and agricultural products

The present country evaluation confirmed the strong involvement of NFI which was the key beneficiary. NFI appreciates the support received from UNIDO in the form of training of staff in Thailand as well as in selected laboratories of Europe. They acknowledge that the knowledge gained through the project is relevant for conducting pilot training of laboratory staff from neighbouring countries. Following the experience gained through the project, NFI has adopted an institutional approach to strengthen the capacity of testing laboratories in order to support their industrial clients in Thailand. In spite of several changes in the senior management, NFI continues to sustain the activities initiated with support from UNIDO and is keen to further deepen the relationship with UNIDO by serving as a trainer in UNIDO projects in the neighbouring Less Developing Countries (LDCs).

Environment and Energy

The environment and energy portfolio includes all GEF supported projects (Full-Scale, Medium-Scale and Project Preparation Grant). Following are the energy-related on-going projects:

- Reducing industry’s carbon footprint (CFP) through compliance with an energy management system (FSP)
- South-South technology transfer: the case of ethanol (FSP)
- Promoting small biomass power plants in rural Thailand (MSP)
- Promoting the demonstration, deployment, and transfer of innovative low-carbon technologies (FSP)
- Promoting investments in the production and usage of bio-fuel to reduce GHG emission in industries (PPG)
- Greening industry through low carbon technology application for SMEs (PPG)

Reducing industry’s carbon footprint through compliance with an energy management system

The evaluation finds a strong involvement of the main partner. While outputs achieved so far actually exceed what was planned, there should be more focus on the long-term sustainability of the initiatives. Due to limited inter-ministerial cooperation and parallel initiatives, potential synergies have not been fully tapped.

Final beneficiaries are happy with the performance improvements they have achieved by adopting the project's approach. There is a mismatch between the focus of the project (large industries) and the key interest of the main partner (SMEs). If the budget permits, a more innovative approach needs to be contemplated to address the challenges faced by the SMEs.

South-South technology transfer: the case of ethanol

This is a project led by Thailand to transfer the bioethanol technology to neighbouring countries by strengthening their institutional capacity for technology dissemination and through demonstration and commercialization of the technology.

This project witnessed some difficulties and delays because the key project partner declined to participate after the project received GEF approval. As a result, the project lacks an institutional partner. An academic institution that volunteered to assist in project implementation plays the dual role of project partner and the key consultant, giving rise to conflicts of interest. The mid-term review pointed out several anomalies that were hindering the achievement of the planned outputs and the overall project sustainability. Recommendations of the mid-term review are now being implemented to improve project management, focus on activities that would ensure project sustainability, adopt a more effective monitoring mechanism, and establish a more active and participatory PSC.

Promoting small biomass power plants in rural Thailand

In line with the Thai government's vision, this project is aimed at introducing suitable policy favouring community-based biomass power plants through a pilot initiative that involves capacity building for the development and sustainable operation of a small community-based on-grid biomass power plant.

The evaluation concurs that this project is of high relevance to the government and enjoys strong ownership of the main institutional partner. The project has faced some difficulties in going ahead with the pilot initiatives and time delays. One of the main reasons is the limited consultative process during project development, resulting in the exclusion of some of the key stakeholders in the project. Time delay in execution could have been avoided to some extent by putting in place a more formal project management unit that ensures timely monitoring of the progress made by the project. It is worth mentioning here that the key institutional partner recognizes well the barriers to be dealt with. Though there are chances that the project may not achieve the expected outputs within the remaining time, efforts are on to create a suitable policy environment to sustain the project initiatives.

Promoting the demonstration, deployment and transfer of innovative low-carbon technologies

As a part of the global flagship programme Cleantech Programme initiated by UNIDO in partnership with GEF, this project aims at establishing a national cleantech platform to promote clean technology innovations and business models for SMEs in Thailand.

The evaluation validates the project initiative which is in agreement with Thailand's industrial development master plan, and would strengthen policy and regulatory framework for scaling up and accelerating cleantech competition and innovation across Thailand. Project activities have yet to be initiated in spite of getting GEF approval for a long while. This is partially due to the lack of stakeholder involvement during project formulation and non-inclusion of important players active in the research and innovation field targeting SMEs.

Further delays are expected because the government policy requires approval of the Cabinet for projects supported by international organizations. As the project activity is linked with a global event that is held once a year, any delay in receiving the Cabinet approval may adversely affect the project execution by delaying the project activities by one more year.

Promoting investments in the production and usage of solid bio-fuel to reduce GHG emissions in industries

The objective of this project is to develop policy framework for promoting investments in solid bio-fuel production and usage through the demonstration of solid bio-fuel production and utilization.

The project proposal displays a strong ownership of the Ministry of Industry as well as other key partners. However, UNIDO is perceived to be occupying the driver's seat as a result of which the national counterparts tend to depend heavily on the initiatives taken by UNIDO.

The evaluation assesses the project to have a very narrow focus on the pilot initiative without giving due attention to the long-term policy changes needed to ensure sustainable production and use of solid biofuels in Thailand. The institutional stakeholders of the project are unsure about the level of economic risks associated with the project, particularly during a time when the global fossil fuel prices have fallen to very low levels. The project needs to target the development of policy that ensures the competitiveness of the biofuel at all times as it has been so well demonstrated by the Thai government in the case of liquid bio-fuels for the transportation sector.

Greening industry through low carbon technology application for SMEs

This project is aligned with the national industrial development policies, with an aim to develop policy measures and streamlining incentive schemes to promote RETs for heat generation in SMEs.

This project has high relevance in the context of Thailand, especially as it meets the national industrial development objectives. It is a pity that the project had to be dropped because the lead institutional partner declined to lead the project.

The two environment-related regional projects carried out with Thailand's participation are:

- Regional plan for introducing Best Available Technique/Best Environmental Practices (BAT/BEP) strategies to reduce Persistent Organic Pollutants (POPs)
- Demonstration of BAT/BEP in fossil-fuel fired utilities and boilers to reduce POPs

Regional plan for introducing BAT/BEP strategies to reduce POPs

This completed regional project focusing on the establishment of BAT/BEP regional coordination mechanism and extension of BAT/BEP guidelines, included Thailand among many other countries in the region.

The evaluation finds that the project is relevant in the context of Thailand though the level of institutional involvement could be stronger in the project. It validates the findings of the Independent Terminal Review that the training and capacity building activities were carried out effectively by the experts engaged by the project. A positive outcome of the project is the issuance of dioxin standards for priority source categories including metallurgical sector, waste incinerator and crematoria.

Demonstration of BAT and BEP in fossil fuel-fired utilities and boilers to reduce POPs

This regional project which is in an advanced phase of execution aims at disseminating pollution prevention/cleaner production measures in fossil fuel-fired utilities and industrial boilers by undertaking concrete pilot activities in several countries of the region, including Thailand.

This project had the same Thai partner as the other regional project involving the same topic. Hence, some of the findings are similar to the ones made for the earlier

project. While the project is very much relevant to Thailand, the level of institutional involvement in Thailand is relatively low and there is a need for higher country ownership to ensure sustainability. The interaction between the national project partner and the country project manager is rather limited, possibly due to the fact that the overall project budget is modest compared to the number of countries covered and the number of outputs targeted.

The project duration has been extended due to the delays, particularly in the implementation of the pilot projects in the countries. At the time of evaluation, access to limited project documents makes it difficult to assess what outputs have been delivered. Moreover, desk studies showing considerable energy savings with BAT/BEP in Thai pilot projects are yet to be validated with actual data gathered from the targeted industrial plants.

Role of UNIDO Regional Office

UNIDO has established a strong relationship with the key institutional partners in Thailand over the years. The government counterparts recognize the contribution of UNIDO RO as well as its staff, and UNIDO's technical assistance is relevant and valued.

Other UN agencies based in Bangkok appreciate the proactive stance of UNIDO RO and the role it plays as an active member of the UN Country Team (CT) in spite of the fact that the RO has very limited staff and resources. UNIDO RO is heavily engaged in the formulation of the next UNPAF that is oriented towards supporting the government in achieving Sustainable Development Goals (SDGs) and creating a more inclusive society.

UNIDO RO is also well appreciated by the UNIDO Head Quarters (HQ) staff for the assistance extended during the different phases of project development: recommending suitable counterpart agencies and establishing preliminary contacts, facilitating the designing of the project document, supporting and trouble-shooting during the project execution as the UNIDO HQ staff are far away and have limited opportunities to be present at the points of project execution. Considering the above, there is some confusion in the minds of the Thai counterpart agencies regarding the roles and responsibilities of UNIDO RO vis-à-vis UNIDO HQ staff.

Key recommendations to the Government and UNIDO

The next UNPAF 2017-2021 will be oriented towards supporting the Thai government to achieve SDGs and to create a more inclusive society. Keeping this in mind, following are the key recommendations to strengthen the partnership between the Government and UNIDO so that Thailand can continue to benefit from

the expertise shared by UNIDO for the country's inclusive sustainable industrial development.

- UNIDO should ensure greater government ownership, engagement and commitments during the project designing as well as its execution so that the government actually leads the process while UNIDO plays a catalytic role.
- Many projects are technically sound and the activities planned are output-oriented, but not necessarily developed to ensure long-term impacts. Right from the beginning, both UNIDO and its national institutional partners should keep in view the long-term technical and financial sustainability and/or the policy level changes through the planned initiatives.
- UNIDO is seen today more as an agency which is able to mobilize finances for implementing pilot projects in Thailand; instead, UNIDO should project itself more as an agency that has the necessary technical competence and the capacity to mobilize international expertise which cannot be easily available to the Thai institutional partners.
- UNIDO should develop a country programme for Thailand together with the key government stakeholders in line with UNIDO mandate (ISID, SDG-9) as well as the 12th National Development Plan and Priorities of Thailand (2016-2021). Such a country programme will avoid making isolated interventions with less impact/visibility or an unbalanced portfolio of projects neglecting to a great extent some of the developmental challenges. It will also help to develop a medium-term business plan, committing both UNIDO as well as the government to prioritize the critical areas where policy support is needed, undertake activities for mutual benefits and mobilize the necessary resources.
- For ensuring the successful delivery of the country programme, UNIDO and the Thai government counterpart should set up a high level Inclusive and Sustainable Industrial Development (ISID) coordination mechanism in order to:
 - Develop and provide oversight to the country programme,
 - Engage representatives from relevant ministries, and
 - Link project-specific outcomes to policy formulation, as needs are expressed from the relevant institutions
- To prove greater ownership and commitment, the key institutional partners benefiting from the project should appoint one or more officials to the Project Management Unit (PMU) in order to be actively involved in the day-to-day execution of project and monitoring of project performance as it progresses. This will not only help strengthen the technical and managerial capacity of government officials to design and execute projects efficiently but also formulate policies that would facilitate achieving the intended impacts.
- Now that Thailand is considered as an upper Middle Income Country (MIC), with the exception of GEF funded environment and energy projects, UNIDO

is unable to mobilize support from traditional donors for implementing projects in Thailand. Therefore UNIDO needs to devise more innovative strategy for attracting alternative funding to widen the project portfolio in areas such as productive activities to reduce poverty and trade capacity building.

- As sufficient capacity has already been developed in Thailand to develop and execute pilot projects, UNIDO should focus on activities that are aimed at providing policy support to the government. Moreover, UNIDO could strengthen South-South cooperation in partnership with Thailand for executing projects in neighbouring LDCs that are serviced by UNIDO RO.
- UNIDO could also collaborate more with the private sector and civil society in order to add value and accelerate the pace of inclusive growth.

Lessons learned

The following lessons can be learned from this country evaluation:

- Projects that are designed and executed well will most likely deliver the desired outputs but may not be sustainable in the long run unless sufficient care is taken to ensure the continued involvement of the key drivers.
- Non-materialization of the committed co-funding will invariably jeopardize the project's SMART performance and fall short of the desired outputs and outcomes.
- Capacity of the main project beneficiaries is best built and sustained when UNIDO plays the role of a catalyst than a reactant.
- Better project performance delivery can be assured when the UNIDO HQ team takes the UNIDO RO into confidence in the programme/project design and implementation.

1. Evaluation purpose and methodology

1.1 Introduction

An independent evaluation of the activities and involvement of the United Nations Industrial Development Organization (UNIDO) in Thailand was proposed and included in the UNIDO Office for Independent Evaluation's (ODG/EVA) Work Programme 2015.

The country evaluation assessed the efficiency, effectiveness, impact and sustainability of the UNIDO interventions in Thailand implemented from 2008 and 2015. This included assessment of the relevance of UNIDO's past and on-going interventions in Thailand in relation to national industrial priorities, strategies and needs and the regional and global development agenda, specifically in regards to UNIDO's Inclusive and Sustainable Industrial Development (ISID) agenda and its contribution to UNPAF objectives. Moreover, the country evaluation reviewed the current and potential role of UNIDO's regional office as part of UNIDO's strategic vision with respect to field representation in Asia. The synergies between UNIDO projects and linkages with related support of other donor/agencies were also assessed as well as the issue of funds mobilisation, taking into consideration that the main source of funding in Thailand has been from GEF.

The country evaluation was conducted between November 2015 and January 2016, with field mission in Thailand in November 2015. The evaluation team was composed of Mr. Brahmanand Mohanty, International Evaluation Consultant and team leader, Ms. Tharee Kamuang, National Evaluation Consultant and Mr. Javier Guarnizo, Senior Evaluation Officer, UNIDO Office for independent evaluation. The members of the evaluation team had not been involved in either the design or the implementation of the programme/projects in Thailand.

1.2 Evaluation purpose

The evaluation entails an independent assessment of UNIDO's interventions in Thailand, with 2008 as a starting point. It was designed as a forward-looking exercise seeking to identify best practices and areas for improvement in order to draw lessons to enhance UNIDO's support in Thailand. Major emphasis of the evaluation has been to assess in an objective manner the relevance (priorities of Thailand and UNIDO), efficiency (delivery of outputs), effectiveness (achievement of results) and impacts (sustainability) of UNIDO interventions. It sought to identify factors that have facilitated or impeded the achievement of the objectives. Moreover it tried to assess development impact and, in some cases, projects that had terminated were re-visited.

The main purposes of the evaluation were to assess the:

- Relevance of UNIDO's interventions in relation to national industrial priorities, strategies and needs, and the regional and global development agenda;
- Appropriateness of project designs and the degree of country ownership in design and implementation;
- Efficiency of UNIDO interventions, such as in terms of quality and timeliness of its services;
- Effectiveness of UNIDO's interventions in terms of achievement of outputs and outcomes against their objectives;
- Impact and sustainability of UNIDO's interventions;
- Current and potential role of UNIDO's regional office and eventual opportunities for rationalizing UNIDO's field presence in Asia;
- Contributions to the achievement of national development and UNPAF objectives.

Further, the evaluation aimed at:

- Generating findings and drawing lessons that can feed into future UNIDO projects and programmes in Thailand as well as other countries covered by UNIDO's Regional Office and possibly elsewhere;
- Serving as input for the future cooperation between Thailand and UNIDO.

1.3 Evaluation scope

As per the Terms of Reference (ToR) included as Annex A, the evaluation covered the full range of UNIDO's activities in Thailand since 2008. It assessed the relevance of UNIDO interventions and synergies among them. It also tried to understand why projects had succeeded or failed/faced problems, and identified good practices and lessons learned. It further reviewed the coordination and management arrangements and functions, including the role of the Regional UNIDO Office, in particular its positioning in Thailand which serves as a UN regional hub. The evaluation also assessed the Regional UNIDO Office's participation in Joint Teams and Working Groups and its contribution to UNPAF priorities.

Apart from portfolio review, the evaluation also reviewed the performance and impact of selected individual projects, clustered by theme. Three out of the seven on-going projects were due for evaluation in the course of 2015/16; hence they were evaluated in a general manner, focusing on issues such as relevance, ownership, synergies and the overall state of implementation. Three other projects were recently approved and as it was premature to assess their results, the assessment focused on their relevance and overall design. The project related to green industry through low carbon technology application for SMEs was dropped because the main institutional

partner declined to lead the project. Hence no evaluation could be undertaken for this project which was particularly relevant to Thailand's industrial priorities.

Concerning the completed projects, since the UN lead agency, the Food and Agricultural organization (FAO) has got the UN Joint Programme (TF/THA/09/004. Livelihood development) evaluated in November 2013, the current evaluation assessed the follow-up of recommendations. The completed trade capacity building projects (XP/THA/08/001; EE/THA08/002; US/THA/07/001 – upgrading of chemical testing laboratories; EE/THA/10/001; TE/THA/10/002; EE/THA/08/003 – upgrading of test laboratories for food and agricultural products) are relatively small, hence they were reviewed as a cluster of projects, assessing to what extent and how the upgraded laboratories have been used and UNIDO's overall contribution to the development of quality infrastructure.

With respect to the regional projects, the project related to the Stockholm Convention in the East and South East Asia (ESEA) region was already evaluated in 2014; hence the country evaluation assessed the follow-up of its recommendations with respect to Thailand. The on-going project (TF/RAS/09/004, NEEM, building on a prior phase) provided an opportunity to assess the role of Thailand in the project as beneficiary.

The country evaluation took into consideration the following past evaluations which addressed issues relevant to the country/region:

- Program-wide final evaluation of project TF/THA/09/004 – UN Joint Programme on integrated livelihood development in Mae Hong Son, 2013;
- Thematic evaluation of UNIDO's work in the area of Persistent Organic Pollutants (POPs), 2012, including the independent cluster evaluation of UNIDO projects covering enabling activities to review and update the National Implementation Plans for the Stockholm Convention as POPs (on-going);
- Independent evaluation of GF/RAS/10/006, regional plan for the introduction of BAT/BEP strategies to industrial source categories of Stockholm Convention Annex C of Article 5 in ESEA region (POPs), 2014.

Assessments of individual projects are synthesised in Chapter 2. Of the 11 projects identified for review and assessment, 2 fall in the category of Trade Capacity Building, 8 within energy and environment and only one within the poverty reduction through productive activities.

1.4 Evaluation methodology

The evaluation was participatory and involved stakeholders, including government counterparts and representatives from the private sector and civil societies, other UN organizations, donors and beneficiaries, as well as UNIDO and project staff. It was

conducted in line with the ToR for the evaluation and due attention was given to the evaluation issues and questions developed in the ToR.

In terms of **data collection** the evaluation team used a variety of methods ranging from desk review (project documents, progress reports, mission reports, SAP (System Applications and Products) search, evaluation reports, internet search, etc.) to individual interviews with counterparts, focused group discussions, and direct observation at project sites. To the extent possible information was validated through secondary filtering and cross checks by a **triangulation** of sources, methods and data.

Evaluation of projects included an assessment of project design and intervention logic, a validation of available progress information through field visits, interviews with key stakeholders and beneficiaries, a context analysis of the project to validate implicit and explicit project assumptions and risks and interviews with government agencies and donors regarding the developments and tendencies in the project-specific environment.

The evaluation team did not come across any substantive Global Forum Activity implemented in Thailand except for the ones in the biannual progress report of Thailand reported on 30th April 2015. The Intergovernmental Negotiation Committee on Mercury 6 (INC6) under the Minamata Convention met in November 2014 and the 35th Meeting of the Open-ended Working Group of the Parties to the Montreal Protocol met in April 2015. During both these events, discussions were held on GEF 6 for chemicals, resulting in the development of pipeline projects for Thailand, such as greening scrap metal value chain, urban-industrial symbiosis with green chemistry applications, and Minamata Convention Initial Assessment.

The following projects were assessed individually:

- TF/THA/09/004 – UN Joint Programme on Highland Livelihood Development in Mae Hong Son
- XP/THA/08/001, EE/THA/08/002, US/THA/07/001 – Upgrading the Technical and Personnel Capacity of the Target Thai Chemical-Testing Laboratories
- TE/THA/10/001, TE/THA/10/002, EE/THA/08/003 – Strengthening the Capacities of Testing Laboratories for Food and Agricultural Products
- GF/THA/11/001, XP/THA/11/002 – Industrial Energy Efficiency in Thailand (GEF project)
- GF/THA/12/001/A01, XP/THA/12/002, GF/THA/10/006, XP/THA/10/005 – Overcoming Policy, Market and Technological Barriers to Support Technological Innovation and South-South Technology Transfer: the Pilot Case of Ethanol Production from Cassava (GEF Project)
- GF-100258, XP-100258, GF/THA/10/004, XP/THA/10/003 – Promoting Small Biomass Power Plants in Rural Thailand for Sustainable Renewable Energy Management and Community Involvement (GEF Project)

- GEF-130312 – GEF UNIDO Cleantech Programme for SMEs in Thailand (GEF project)
- GEF (PPG) – 130075 – GEF 5 Preparatory Assistance: Greening Economy through Low Carbon SMEs Development in Thailand with the office of SMEs Promotion - OSMEP (GEF Project)
- GEF (PPG) – 130319 – GEF 5 Preparatory Assistance: Reduction of GHG Emission from Thai Industries through Promoting Investment of the Production and Usage of Solid Bio-Fuels (GEF Project)
- GF/RAS/09/006, GF/RAS/10/006, XP/RAS/11/001 – Regional Plan for Introduction of BAT/BEP Strategies to Industrial Source Categories of Stockholm Convention Annex C of Article 5 in ESEA Region (GEF Project)
- GF/RAS/09/001, GF/RAS/10/003/A03, XP/RAS/11/002 – Regional Project: Demonstration of BAT and BEP in Fossil-Fired Utility and Industrial Boilers in Response to Stockholm Convention of POPs (Covering Cambodia, Loa PDR, Indonesia, Mongolia, Philippines and Thailand) (GEF Project)

The Country evaluation took place between November 2015 and February 2016. Initial interviews were conducted with the UNIDO project managers and representatives of the Thai Permanent Mission in Austria prior to the evaluation mission. A two-week field mission was conducted in November 2015. The evaluation team started the fieldwork together and had a number of joint meetings. According to the requirement, the team divided the work according to sectors and projects to be covered. Interviews were semi-structured and qualitative, allowing for follow-up questions and inputs from the interviewees.

Presentation of preliminary findings took place in Thailand at the end of November 2015 and at UNIDO Headquarters in the 2nd week of December 2015. The list of persons consulted is attached as Annex 2 while Annex 3 provides a list of documents consulted. The draft report was shared with internal and external stakeholders for comments and factual validation in February 2016.

The overall time schedule is presented in the table below:

Activity	Estimated period
Collection of documentation by ODG/EVA	September, October 2015
Desk review by members of evaluation team	November 2015
Interviews at HQ	Second week of November 2015
Field work in Thailand (2 weeks)	Third and fourth week of November 2015
Presentation of preliminary findings at HQ	Second week of December 2015
Drafting of report	January 2016
Collection and incorporation of comments into report	April 2016
Issuance of final report	May 2016

1.5 Limitations

Reports and monitoring data in relation to individual projects were not always available or up to date, and when available, varied greatly in quality and coverage. The evaluation team is, nevertheless, of the opinion that the findings are reliable.

2. Country context

2.1 General background

Thailand, officially the Kingdom of Thailand, formerly known as Siam, is a country at the centre of the Indochinese peninsula in Mainland Southeast Asia. After the short-lived kingdom of Sukhothai founded in 1238, a unified Thai kingdom (Ayutthaya) was established in the mid-14th century; it was known as Siam until 1939. Thailand is the only Southeast Asian country that has never been colonized. The country's official language is Thai and the primary religion is Theravada Buddhism, which is practiced by around 95% of the population.¹

Thailand is bordered to the north by Myanmar and Lao PDR, to the east by Lao PDR and Cambodia, to the south by the Gulf of Thailand and Malaysia, and to the west by the Andaman Sea and the southern extremity of Myanmar. Its maritime boundaries include Vietnam in the Gulf of Thailand to the southeast, and Indonesia and India on the Andaman Sea to the southwest. Most of Thailand has a "tropical wet and dry or savanna climate" type (Köppen's Tropical savanna climate). The south and the eastern tip of the east have a tropical monsoon climate.²

With a total area of approximately 513,000 km², Thailand is the world's 51st largest country. It is the 20th most-populous country in the world, with around 66 million people. Thailand had an urban population of 49.17% as of 2014, concentrated mostly in and around the Bangkok Metropolitan Area.³ Bangkok is Thailand's political, commercial, industrial, and cultural hub.

Thailand has an unemployment rate below 1%. Poverty has declined substantially over the last 30 years from 67% in 1986 to 11% in 2014 as incomes have risen.⁴ Income inequality, as measured by the Gini coefficient, has fallen in recent years, but stays consistently high above 0.45.⁵ In 2014 the literacy rate of Thailand was 93.5%.⁶

Thailand is likely to meet most of the Millennium Development Goals (MDGs) on an aggregate basis. Thailand introduced its Universal Health Coverage Scheme in 2001 and has largely achieved its goal of providing access to affordable health care for all.⁷ Maternal mortality and under-five mortality rates have been greatly reduced and more than 97 percent of the population, both in the urban and rural areas, now have

¹ https://en.wikipedia.org/wiki/History_of_Thailand

² <https://www.nationstates.net/nation=retiva/detail=factbook/id=542601>

³ https://en.wikipedia.org/wiki/History_of_Thailand

⁴ <http://www.worldbank.org/en/country/thailand/overview>

⁵ <http://www.th.undp.org/content/thailand/en/home/countryinfo.html>

⁶ http://www.unicef.org/infobycountry/Thailand_statistics.html

⁷ <http://pov-econs.weebly.com/current-events.html>

access to clean water and sanitation.⁸ At the same time, there are concerns about environmental sustainability.

Thailand participates fully in international and regional organisations. The country remains an active member of Association of Southeast Asian Nations (ASEAN). Thailand has developed increasingly close ties with other ASEAN members: Indonesia, Malaysia, the Philippines, Singapore, Brunei, Laos, Cambodia, Myanmar, and Vietnam, whose foreign and economic ministers hold annual meetings. Regional co-operation is progressing in economic, trade, banking, political, and cultural matters.

Among the ten ASEAN countries, Thailand ranks third in quality of life. Its large population and growing economic influence have made it a middle power in the region and around the world.⁹

2.2 Economic development

Thailand has made remarkable progress in social and economic issues, moving from a low-income to an upper-income country in less than a generation. Thailand has a well-developed infrastructure, a free-enterprise economy, generally pro-investment policies, and strong export industries. Manufacturing, agriculture, and tourism are leading sectors of the economy. Thailand achieved steady growth largely due to industrial and agriculture exports - mostly electronics, agricultural commodities, automobiles and parts, and processed foods. Thai economy has weathered internal and external economic shocks in recent years.

Thailand's high economic growth at 8-9 percent per year during the late 1980s and early 1990s was interrupted by the "Asian Crisis" of 1997-1998. Since then, average annual economic growth has moderated to less than 4 percent.¹⁰ This moderation reflects a combination of some decline in export competitiveness to newly emerging regional economies, a shortage of skilled labour and knowledge workers for the modern knowledge economy, and political changes and uncertainty that have affected public and private investment. In late 2011 Thailand's recovery was interrupted by historic flooding in the industrial areas in Bangkok and its five surrounding provinces, crippling the manufacturing sector.¹¹ More recently, Thailand's economy expanded by a low 0.9 percent in 2014 and is expected to pick up slightly in 2015-2017.¹²

The rate of recovery and reigniting economic growth will depend on how fast Thailand can overcome factors constraining growth and promote a more inclusive

⁸ <http://www.worldbank.org/en/country/thailand/overview>

⁹ <https://en.wikipedia.org/wiki/Thailand>

¹⁰ <http://www.th.undp.org/content/thailand/en/home/countryinfo.html>

¹¹ <http://www.aseanplusgroup.com/thailand>

¹² <http://pattayaproperty.pro/thailand-economy-2/4-thailand-economy/>

growth model. There are opportunities in the horizon, including expanding trade through enhanced integration with the global economy, bolstering growth by implementing transformative public investments to crowd-in private capital, stimulate domestic consumption, and improving quality of public services across the entire country. This will support a resumption of higher, more balanced, growth path that eliminates extreme poverty and boosts shared prosperity for all citizens.

To address the persistent disparities between the urban and rural population, and the hollowing out of traditional village life due to the economic pull of cities, the Government has put ‘people-centred development’ based on the Sufficiency Economy philosophy at the centre of its national development strategy.¹³ The strategy also aims to achieve better balance between economic growth and environmental sustainability with self-reliant communities managing their natural resources. Key elements of this strategy are decentralization of authorities to local governments, promotion of good governance, and community capacity development.

2.3 Challenges to growth

Thailand has made remarkable progress in human development, moving from a Human Development Index (HDI) of 0.572 in 1990 to become a country with high HDI of 0.726 in 2014.¹⁴ Thailand is also likely to achieve most of the global Millennium Development Goals by the end of 2015 although pockets of vulnerability remain. Despite remarkable progress made, Thailand continues to face persistent and critical development challenges. These include the political crisis and deep-rooted conflicts within Thai society between 2005 and 2014, coups d’état in 2006 and 2014, the global financial crisis in 2008 and the severe flood in 2011.

Since 31 December 2015, the ten ASEAN member countries have officially launched the long awaited ASEAN Economic Community (AEC). With this important milestone, Southeast Asia sets its eyes towards new heights of development and a more integrated region that will gain in global competitiveness. The beginning of the AEC brings new hope for Southeast Asia, as there is likely to be a surge in trade between ASEAN countries, as most tariffs and barriers have been eliminated. Within ASEAN, some major countries are facing challenges, like the political uncertainty weighing on the Thai economy.

Thailand’s economy may be at a turning point. Thailand’s manufacturers are at risk of losing their competitive niche because of the lack of skilled workers needed for more hi-tech industries and the emergence of cheaper labour in neighbouring countries. The state-owned enterprises are not as efficient as the private sector and the SMEs are clamouring for more government support.

¹³ <https://www.oecd.org/countries/thailand/48703240.pdf>

¹⁴ <http://hdr.undp.org/sites/default/files/hdr14-report-en-1.pdf>

Thailand suffers from the so-called “middle-income country trap”. The country faces serious socio-economic inequalities and there are many groups of people who have been left behind in the process of the country’s development. These include children, elderly people, persons with disabilities, migrants, ethnic minorities, indigenous people, sexual and gender minorities, displaced persons, etc. Thailand’s income inequality, as measured by the GINI coefficient, remains one of the highest in the region. As an export dependent economy, Thailand is facing significant decline in export over the last couple of years. Moreover, the household debt continues to rise.

Some of the key fundamental constraints faced by Thailand include the quality of education, low level of research and development, low productivity gains, dependency on exports and natural resources depletion.

2.4 Environment, natural resources and climate change

Thailand’s rapid economic growth has helped the country to achieve middle-income country status but in the process, it has led to considerable environmental challenges to the once agrarian society. Thailand now faces a number of environmental challenges such as air and water pollution, deforestation, soil erosion, water scarcity, hazardous waste disposal and biodiversity shrinkage. Environmental degradation, disruption of the ecosystem and climate change are some of the causes of the frequent floods and increasing incidence of vector-borne diseases.

Illegal logging and subsequent trafficking, forest fires, expansion of farmland and extension of public infrastructure and private residences have contributed to the loss of forest. There is also the problem of the shrinkage of marine and coastal resources as well as increased level of water pollution. The sea grass and coral reef ecosystem are seriously damaged and the fishery catch has reduced. The quality of water in main rivers and fresh water lakes is getting worse. Available water is not adequate to meet the demand. With more erratic rainfall due to adverse impact of climate change, more droughts and floods are expected, leading to conflicts over water resources among the users.

Energy demand has been increasing incessantly over the last 3 decades to cope with industrialization and economic growth. Fossil fuels (coal, oil and natural gas) account for more than three-quarters of Thailand’s primary energy consumption. However, since Thailand has limited domestic fossil fuel production and reserves, the country is heavily dependent on significant amount of fossil fuel imports. Seventy-three percent of the total GHG emissions in Thailand are accounted for by the energy sector. However, Thailand’s GHG emissions represent only 0.84% of global emissions in 2012 and the per capita GHG emissions is 5.63 tCO₂e.¹⁵ Due to growing public resistance to tapping traditional forms of energy such as coal, as well as increasing political concern over the country’s reliance on imported natural gas, Thailand has been placing more emphasis on renewable energy in recent years. Since 2007, the

¹⁵http://www4.unfccc.int/submissions/INDC/Published%20Documents/Thailand/1/Thailand_INDC.pdf

government has been providing an incentive in the form of feed-in-tariffs to boost private investment and encourage public participation in renewable energy, especially solar. Through a combination of policy support and technological innovation, Thailand is also beginning to tap into the full potential of the bio-economy-based energy sources such as biomass and biogas.

Solid waste has been increasing year after year while the waste treatment and disposal capacity is inadequate. Only 18 percent of the total waste generated was recycled in 2013, while about one-third of the remaining amount was disposed of correctly and the remaining amount was disposed of poorly or improperly. As much as 81 percent of the 2490 waste disposal sites nationwide are considered substandard. About 2.69 million tons of hazardous and chemical waste was generated in 2013, mainly from waste electric appliances. As a result of increasing industrialization and mineral extraction, Thailand faces rising concerns about health impacts from pollution in numerous sites around the country.

Thailand is vulnerable to natural hazards, including floods, tsunamis, storms, droughts, landslides, forest fires, earthquakes and epidemics. As many as 224 flood incidents were reported during 1991-2011, resulting in human and colossal materials losses. Disaster management policy in the past focused more on post-disaster relief and response operations rather than on proactive prevention initiatives to manage risks and reduce potential impacts.

There is a need to create awareness and sensitize the Thai population so they take greater responsibility to cope with natural and man-made disasters that have adverse impacts on climate change as well as the social, economic and environmental domains. Shifting the country towards a green economy will ensure greater sustainability by reducing the dependence on high carbon, high polluting industries and products, making greater R&D investments on low-carbon energy technologies, promoting the use of renewable forms of energy, etc.

The Thai society has become more aware of environment issues through the efforts made by the government, private sector and non-governmental organizations. Nevertheless, much more needs to be done to disseminate success stories of community-based environmental management and integrating environment and other sustainable development issues at the educational level.

2.5 Industry

Thailand's first stage of industrialization in the 1980s and the first part of the 1990s succeeded because it was founded on low-cost, semi-skilled labour and healthy foreign investment. A vigorous sub-contracting sector grew up to serve the big names of the global garments, auto and electronics sector and the components they specified. But the next stage has proved much more difficult. Thailand is the 17th largest manufacturer of goods out of 144 countries. It is also the 28th largest in export volume and 11th most competitive manufacturing nation as of 2013. However,

Thailand is trailing in R&D spending, the foundation of the value-creating innovation needed to drive productivity, new technology, etc. Thailand's R&D investment has been stuck for decades at just 0.2 – 0.3 percent of GDP, putting it presently at the 60th rank in the world.

Following the establishment of the Board of Investment (BOI) in 1966, the first-ever industrial estate was set up north-east of Bangkok with a drive to promote investment for exports. The late 1980s was a significant turning point for Thailand which welcomed Japanese manufacturers that were on the lookout for cheaper places to make their goods and cars. The same decade also witnessed the development of a huge refining and petrochemical industry in the eastern seaboard thanks to the commercial discoveries of gas in the Gulf of Thailand. This led to the mushrooming of industrial plants churning out electronic components, machineries and cars. Such industrialization made Thailand a champion among the “Newly Industrializing Countries” (NICs). When Thailand suffered its worst floods in 2011, widespread damage not only impacted millions of people but also caused a global shortage of computer disk drives and slowdown of production at Japanese car plants around the world because of their reliance on components made in Thailand.

Over the years, successive governments have set up ministries and institutions, passed laws and appointed experts on various aspects associated with the manufacturing industry and economic development. Among the various bodies, there are the National Research Council of Thailand, the Ministry of Science and Technology, the National Science, Technology and Innovation Policy Office, and the National Science and Technology Development Agency. However, timely action and implementation has been a problem due to various reasons, including the lack of coordination and continuity that arises from the frequent shuffles and reshuffles that go on at the top of the government.

Thailand has about 2.8 million small- and medium-sized enterprises (SMEs), representing 99 percent of the total enterprises, providing 4 out of 5 jobs and contributing to 40 percent to the economic output and 30 percent to exports. About 30 percent of the SMEs are in the manufacturing sector. The Small and Medium Enterprises Promotion Act was passed in 2000, providing clear definitions and classifications of SMEs and outlining programs for their promotion, including the establishment of the Office of Small and Medium Enterprises Promotion (OSMEP). Thailand has one of the highest female entrepreneurship rates in the world, though this has been declining over the past few years.

Almost a third of those engaged in the SME sector are characterized by low productivity, lack of growth potential and offering poor income and employment conditions. While there has been an increase in “linkages” between multinational firms and Thai SMEs in the automobile and parts industry, the foreign direct investment in SMEs is very limited. In spite of the existence of the SME Development Bank and an increasing interest in SME loans among commercial banks, small firms struggle to find access to capital. Because of their lack of technologies and managerial

competitiveness, Thai SMEs are losing out to foreign firms. This is made worse by Thailand's low level of investment in research and development.

2.6 Government policies, strategies and initiatives

There has been a significant change in Thailand's development planning since the 8th Plan (1997-2001): a shift from growth-oriented approach to the model of holistic "people-centred development" to ensure more balanced growth. Priority was given to broad-based participation with active engagement of the private sector, civil society and academia. However, economic mismanagement that led to the 1997 Asian Crisis prompted the adoption of the philosophy of Sufficiency Economy as the guiding principle of the 9th Plan (2002-2006).

The 10th Plan (2007-2011) emphasized the extensive and practical application of the Sufficiency Economy concept, which resulted in greater resilience in various aspects of Thai society and enabled Thailand to cope effectively with the impacts of the 2008 global economic crisis. The results are reflected in the Green and Happiness Index (GHI) of 65-67 percent achieved thanks to the strong economic performance, high employment, and strong communities and family ties. Evaluation of the 10th Plan indicated an improved economic foundation for development and better quality of growth, and an improved quality of life due to better access to various economic and social security measures and gains in poverty reduction. However, some of the major obstacles remained such as political unrest, environmental and ecological degradation and low quality of education. A need is felt to place emphasis on the development of human capital and security, promotion of good governance and fair competition, and a more equitable distribution of development benefits in order to reduce social inequity.

Thailand continues to face major domestic and global changes that may pose threats or provide opportunities for the country's development. As far as domestic challenges are concerned, foreign direct investment has remained a critical factor for economic growth. However, the global economic recession and decline in Thailand's competitiveness have affected domestic investment. Other obstacles to economic restructuring include science and technology, quality of infrastructure and weak regulations. On the social front, while various types of social welfare and protection have been extended to increasing number of people, some disadvantaged groups have lacked access to social services and access to resources. And on the environmental perspective, natural resources and the environment have not been managed effectively and there are conflicts between environmental conservation and economic development.

Changes at the global level are also affecting the development in Thailand. Reforms have led to new rules and regulations in trade, investment, finance and environmental and social matters. Some of these rules are being used as non-tariff barriers. Hence Thai industries must improve production processes and business

practices in order to enhance their competitiveness, engage in fair competition and adopt corporate social responsibility (CSR).

Global warming has led to unpredictable alteration to climate as well as more frequent and severe natural disasters, contributing to damages in infrastructure and industrial zones. The food and energy security is under intense threat worldwide due to the increase in population, decrease in agricultural products and climate change. Thailand is slow to make technological progress; hence it depends primarily on imported technologies. Unless there is a shift in Thailand towards becoming a technology provider, the country will face low productivity and lose competitiveness over time.

The 11th Plan (2012-2016) has been designed by taking into account the current resilience of Thai society and its economy to prepare both individuals and society as a whole to cope with the effects of the complicated domestic and global changes and fluctuations and pave the way towards well-balanced development under the philosophy of Sufficiency Economy. With a vision to create a “A happy society with equity, fairness and resilience”, one of the key missions of the 11th Plan is to build secure natural resource and environmental bases by supporting community participation and improving resilience that will cushion impacts from climate change and disasters. Another important mission is to enhance the efficiency of production and services based on local wisdom, knowledge and innovation and creativity by developing food and energy security, while forming the structure of economy such that consumption becomes more environment-friendly. Thailand will adopt development strategies to create and utilize economic opportunities, knowledge, technology and creativity for ensuring environmentally friendly production and consumption leading to sustainable development.

The key development strategies include the following:

- Create a just society;
- Develop a life-long learning society;
- Strengthen agricultural sector and security of food and energy;
- Restructure the economy towards quality growth and sustainability;
- Create regional connectivity for social and economic stability, and
- Manage natural resources and the environment towards sustainability.

Major tools to drive development plans at all levels and in all segments of the society include action, knowledge, innovation and creativity. Moreover, all development partners are urged to collaborate through the clusters approach, and be responsive to problem solving and area development. In addition to ministries and departments at the central level, agencies at the provincial level are expected to play a critical role in synchronizing the national agenda with area-based development and local issues in order to tackle problems and capitalize on the potential at the area and local levels.

2.7 National Industrial Development Master Plan

Thailand's future economy as well as its social and environmental development is already being affected by major changes such as globalization and trade liberalization; climate change and geographic change will affect Thailand's future economy, as well as its social and environment direction. To deal with such changes, the Ministry of Industry established the 20-Year Master Plan for Thailand's Future Industrial Development during 2010-2029, laying emphasis on the need to drive the country's industrialization so that Thailand can catch up with global industrial and economic trends, by building innovative, well-balanced, and sustainable industries.

The vision is to attain innovative, well-balanced, and sustainable industries, which are divided into 3 phases: (1) Knowledge-based industry (2010-2014); (2) Innovative Industry (2010-2019); and (3) Sustainable Industry (2010-2029). Each phase has a clear-cut theme.

The first phase is about "Preparation for the AEC." This 5-year-period will use fundamental knowledge to improve relevant regulations, lay down an efficient raw materials/ labour structure, drive R&D efforts, develop industrial clusters, and create an ASEAN supply chain. The aim would be to connect the country to the region and the world by expanding logistics networks and strengthening efficient management, thus creating a strong infrastructure in order to become a manufacturing base and regional supply chain. To attract more investors, the Thai government will explore new economic areas for investment, especially in the border trade area. It will also look at new industrial estate development in each region in Thailand, such as the Chiang Khong Industrial Estate, North-eastern Estate, and SMEs Estate.

The second phase of industrial development would be aimed at placing Thailand as a Recognized ASEAN or Regional Supply Chain Manager, through a continuous development from the knowledge stage to the technology stage by using more advanced technology and innovation in the products and services sectors. Upgrading manufacturing standards for the agricultural sector will also be a focus as it can add value to agricultural products while emphasizing the use of an eco-friendly manufacturing system. The application of technology integrated with knowledge will create sustainable development. SMEs will be encouraged to adopt more environmental-friendly technologies and practices.

The third phase, "Thai Brands to Shine in Global Market" will support Thai entrepreneurs and promote Thai brands to achieve global standards and wide recognition. To ensure Thai industries have a balanced approach to economic, social, human development and environment considerations the Government will encourage entrepreneurs to take part in the Green Program to attain Green standard levels according to the Green Industry concept. This is to remind the entrepreneurs to carefully operate their business with concern for the community and surroundings, as they have to rely on each other and live together. The eco-industrial

town concept and the green industry initiative will be promoted to sustain Thailand's industrial development and ensure a good balance among economic, social and human development, and environmental protection.

2.8 United Nations Partnership Framework (UNPAF) 2012-2016

Over the years, the capacity of the government as well as their non-government counterparts has been strengthened. Moreover, while the UN system had limited resources, the government has now the ability to mobilize alternate sources of financing. Hence there is a need to bring about changes to ensure greater relevance and impact of UN support to Thailand. Based on the fact that Thailand had achieved the MIC status, it was felt by the UN Country Team (UNCT) in Thailand that they should move further "upstream" and focus more on knowledge sharing and policy advice, rather than specific projects. Moreover, they should provide such support quickly, flexibly and efficiently.

The UN cooperation with the country has taken the form of a UN Partnership Framework (UNPAF). The new UNPAF for 2012-16 was formulated in consultation with government and nongovernment counterparts and it was aligned with the key development strategies of Thailand's new 11th NESDP. Particular attention was given to the strategies of:

- Promoting the just society;
- Strengthening economic and security cooperation in the region"; and
- Managing natural resources and the environment towards sustainability.

The plan was for the UN to extend support for strengthening the social protection system, enhancing human rights and access to justice, and improving the quality of information for and analysis of issues in social policy. The UN would also support the development of a creative economy in view of the important role this will play in strategically positioning Thailand as a socio-economic regional actor. Apart from assisting Thailand to better respond to the challenges of climate change, the UN system would also work on issues with respect to the nexus between poverty and the environment and energy and the environment.

In determining how best the UN could support Thailand in the above selected and other areas, it was agreed that the new UNPAF needed to recognize "the importance of joint partnerships in selected areas; the added value of continued thematic collaboration of concerned UN agencies; the importance of UN agencies' individual work programs and mandates as well as the normative work of the UN in Thailand; and the importance of the overall framework being a two-way partnership of knowledge and experience sharing."¹⁶

¹⁶ <http://www.th.undp.org/content/dam/thailand/docs/UNDP%20TH%20UNPAF2012-2016.pdf>

The UNCT set itself a target to become a trusted policy advisor, supporting evidence-based normative and advocacy work, forging development partnerships, and maintaining excellence in knowledge and knowledge exchange by 2020.

Following the political turmoil of May 2014, UNCT decided to revise the 2012-2016 UNPAF substantially. It was agreed to focus on only three of the six major areas of collaboration: (1) Inequality and inclusivity; (2) Democratization process, including human rights and decentralization; and (3) Climate change. The UN Joint Programmes (UNJPs) are no longer operational.

2.9 Thailand's Development Assistance Status

The 1997 Asian Financial Crisis and subsequent increase in poverty provoked a dramatic increase in aid to Thailand. However, this was gradually phased out, with the International Monetary Fund closing its Thailand office in 2003. More recently, bilateral trade agreements have been increasing and there is a distinct decline in international debt relief and financial aid.

Having achieved the Middle-Income Country (MIC) status with strong growth, the relationship between Thailand and the international donor community has clearly evolved from the traditional donor-recipient model. Thailand now gets much reduced large-scale financial contributions, although donor agencies continue to assist through targeted areas of action and cooperation, concentrating on specific projects and programmes which take the form of partnerships and cooperation initiatives. This is also reflected by the modest UN support to Thailand.

Thailand is determined to “leap frog” in development status. Government is seeking to consolidate Thailand’s independent standing and to move toward a net contributor status. The country is now focusing on becoming a development partner with former donor-countries, as opposed to a recipient of international aid. Further, Thailand is keen to share its development expertise and assist other countries to advance poverty reduction. Strong features of this policy have been donations to other tsunami-affected countries in the region and on-going assistance to neighbouring countries.

Thailand is keen to assist the development of poorer countries, both within and outside the immediate region through its “Forward Engagement” foreign policy. It is already leading in a number of regional and sub-regional cooperation initiatives in areas including trade, investment and tourism. These initiatives are carried out through bodies, mechanisms and cooperatives such as the Association of South-East Asian Nations (ASEAN), Asia-Pacific Economic Cooperation (APEC), and Greater Mekong Sub-region (GMS) Cooperation.

3. UNIDO strategic directions and interventions in Thailand

3.1 Strategic direction and programme of activities in Thailand

UNIDO's programme of activities in Thailand is aligned with the development themes of the 11th NESDP: *Ensuring food and energy security; Developing knowledge-based economy and enabling environment; Strengthening economic and security cooperation in the region; and Managing natural resources and the environment sustainably*. The government policy is focused on increasing the manufacturing productivity and the industry's environmental soundness and raising the country's market access, investment and trade facilitation. UNIDO's current cooperation framework supports the government's priorities defined within the framework of Thailand's development goals. These include driving existing industries to improve their technologies; promoting "greater connectivity with neighbouring countries"; supporting the agricultural and manufacturing sectors to move towards low carbon and green technologies.

UNIDO supports the emerging paradigm of building a "Creative Economy" (CE) in Thailand. CE will be comprised of several sectors and industries, not only cultural, high technology and innovation but also knowledge-based industries, information and communication technologies as well as new forms of entrepreneurship. UNIDO as part of the UNCT considers this strategy to be part of the macro-level policy support (and knowledge sharing and development). In collaboration with Thai counterparts, UNIDO provides support both at the policy and operational levels. This includes the provision of expert advice to policy makers, specific industries or economic sectors within the following thematic areas: *energy and environment; trade capacity building; and poverty reduction through productive capacities*.

UNIDO's assistance to Thailand in the sustainable management of natural resources and the environment include the following areas: energy and climate change, and environmental management, etc. The nature of UNIDO's support encompasses policy advice, knowledge management, service delivery, pilot project, investment/other financing. In order to support Thailand's priority to ensure balance and security in food and energy and strengthen economic and security cooperation in the region, UNIDO has in the past undertaken projects on poverty reduction through productive capacity and trade capacity building for SMEs and provides support in the forms of policy advice, knowledge management, and service delivery. However, UNIDO currently does not have any projects in these areas in Thailand.

3.2 UNIDO interventions in Thailand (portfolio analysis)

There has been a long history of collaboration between Thailand and UNIDO. Focusing on the more recent past, UNIDO opened the current Regional Office in Thailand in February 2000, succeeding the country office that was closed two years earlier. Though Thailand was among the countries with a first generation Integrated Programme (IP) covering the period 1999-2006, the funding was not adequate. There has not been any specific framework for cooperation between Thailand and UNIDO since then except for the wider UNPAF. The Ministry of Industry of Thailand serves as UNIDO's main counterpart, and UNIDO also collaborates closely with the Ministry of Natural Resources and Environment and the Ministry of Energy.

During the period 2000-2008, UNIDO was mostly involved in preparatory assistance type projects. Thailand is a middle-income country (MIC) wherein attracting donors for traditional projects is a challenge. Most of the projects developed since 2008 are in the areas of environment and energy. Funded solely by GEF, some of these environment and energy projects are in advanced stages of completion whereas others are being started or are in the pipeline. On-going projects funded by GEF have a total budget close to US\$ 10 million while the total projects in pipeline for GEF support exceed US\$ 20 million. There was a UN Joint Programme on integrated highland livelihood development in the Northern Province of Thailand from 2010 to 2013 where UNIDO led one of the programme components, addressing the issue of poverty reduction through productive activities. Two small trade capacity building projects supported by the European Union were implemented between 2008 and 2011. In addition to the national projects, Thailand has also been involved in a number of regional projects. Two among the important regional projects deal with the introduction of BAT/BEP strategies to reduce POPs.

The details of projects covered under this country evaluation can be found in Table 1 of the Terms of References. The projects are shown in **Fehler! Verweisquelle konnte nicht gefunden werden.** with their brief acronyms as references for the following figures.

Figure 1 presents the implementation timeframe of the projects that form part of this country evaluation. The areas with yellow shade show the original project implementation schedule and those with red shade represent the time extended for project implementation. It would appear that 2 TCB projects, focusing on chemicals and food, started implementation approximately at the same time. Focusing and concentrating resources could be considered to achieve substantive results. Similarly, eight projects on energy, covering a wide range of topics, from energy management systems, renewable energy, low carbon technologies, solid bio-fuels, plus two regional projects on BAT/BEP started implementation from 2010 to 2014. A couple of projects have faced serious difficulty in implementation, resulting in an extension of project duration by 2 years or more.

Table 1. Projects that form part of this country evaluation

Theme	Project ID	Project Title	Project Acronym
Poverty Reduction	TF/THA/09/004	UN Joint Programme on Integrated Highland Livelihood Development in Mae Hong Son	PR-Mae Hong Son
Trade Capacity Building	XP/THA/08/001; EE/THA/07/002; US/THA/07/001	Trade Capacity Building in Thailand through Strengthening the Capacities of Testing Laboratories for Food and Agricultural Products	TCB-Food&Agri
	b) TE/THA/10/001; TE/THA/10/002; EE/THA/08/003	Upgrading of the technical and personnel capacity of the target Thai chemical testing laboratory	TCB-ChemLab
Environment and Energy	GF/THA/11/001, XP/THA/11/002	Industrial energy efficiency in Thailand	E&E-IEE
	GF/THA/12/001/A01, XP/THA/12/002, GF/THA/10/006, XP/THA/10/005	Overcoming policy, market and technological barriers to support technological innovation and South-South technology transfer: the pilot case of ethanol production from cassava	E&E-Bioethanol
	GF-100258, XP-100258, GF/THA/10/004, XP/THA/10/003	Promoting small biomass power plants in rural Thailand for sustainable renewable energy management and community involvement	E&E-BioPower
	GEF-130312	Promote the demonstration, deployment, and transfer of innovative low-carbon technologies	E&E-Cleantech
	GEF (PPG)-130319	Preparatory Assistance - Reduction of GHG emissions from Thai industries through promoting investment in the production and usage of solid bio-fuels	E&E-PPG_Biofuel
	GEF (PPG)-130075	Preparatory Assistance - Greening economy through low carbon SMEs development in Thailand	E&E-PPG_GreenEcon
	GF/RAS/10/006	Regional Project: Regional plan for the introduction of BAT/BEP strategies to industrial source categories of Stockholm Convention Annex C of Article 5 in ESEA region	E&E-Reg_BATBEP
	GF/RAS/10/003/A03, XP/RAS/11/002, GF/RAS/09/001	Regional Project - Demonstration of BAT and BEP in fossil-fired utility and industrial boilers in response to Stockholm Convention of POPs	E&E-Reg_BATDemo



Figure 1. Timeframe of the projects (yellow shade: original project implementation schedule; red shade: time extended for project completion). Source: project document, SAP Open Platform accessed on 12/05/2016

Figure 2 shows the types of projects according to category. The Environment and Energy projects are further grouped into Medium/Full-Scale (E&E-Thai), Project Preparatory Grant (E&E-PPG Thai) for Thailand and Regional projects (E&E-Reg).

While projects under E&E-Thai category appear concentrated, each project covers a distinctly different topic.

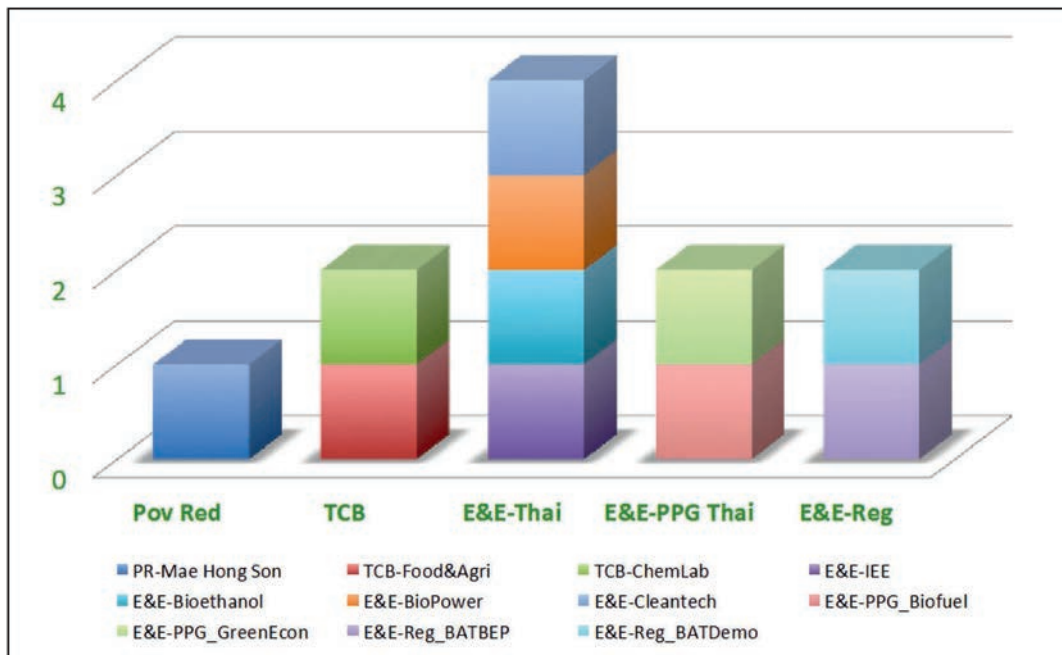


Figure 2. Types of projects, by theme category

Figures 3 and 4 show the percentage share of the funds received for the projects and the sources of funds from 2008 to 2015.

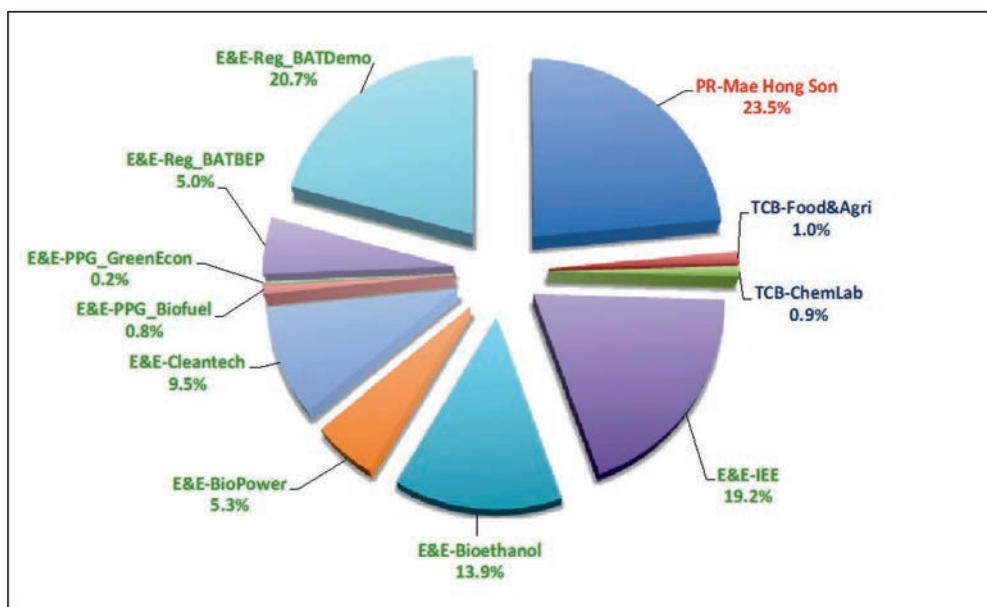


Figure 3. Percentage share of support (in US\$) for the projects (2008-2015). Source: SAP Open Platform accessed on 12/05/2016

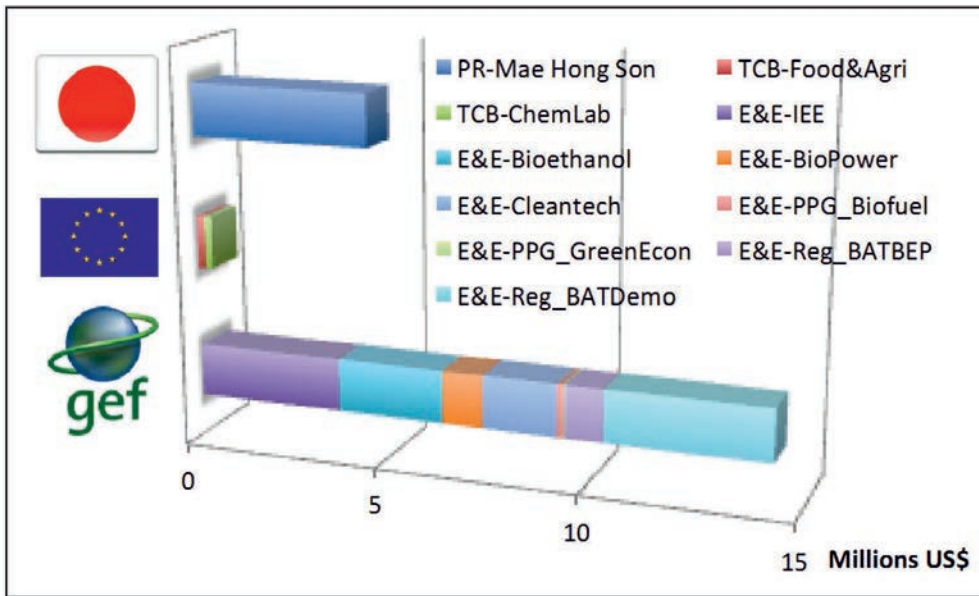


Figure 4. The three major sources of funds for the projects (2008-2015)
 Source: Project documents, SAP Open Platform accessed on 12/05/2016

As it can be observed, GEF accounts for about three-quarters of the project funding, all for Environment and Energy projects, both national (50%) and regional (25%). The remaining sources of co-funding are the European Union and Japan through the United Nations Trust Fund for Human Security.

Figure 5 helps to focus the evaluation on outcome follow up for those projects that were evaluated or had a mid-term evaluation and on project design for those projects that have not been evaluated.

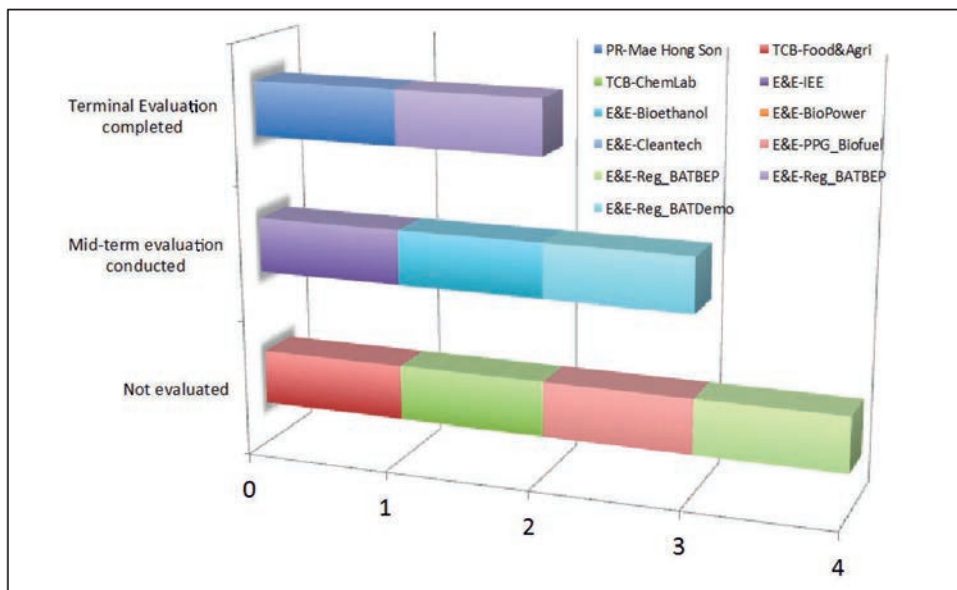


Figure 5. Status of project evaluations. Source: Project documents

Figure 6 gives an idea of the annual expenditures of the national projects supported by GEF (FSP, MSP and PPG). One can see the cumulative project expenditure peaking in 2014. A negative expenditure is shown in 2014 for the EE-Biopower project, indicating some problem. Further, the very low expenditure for the same project in 2015 indicates some issues in the implementation of the same project.

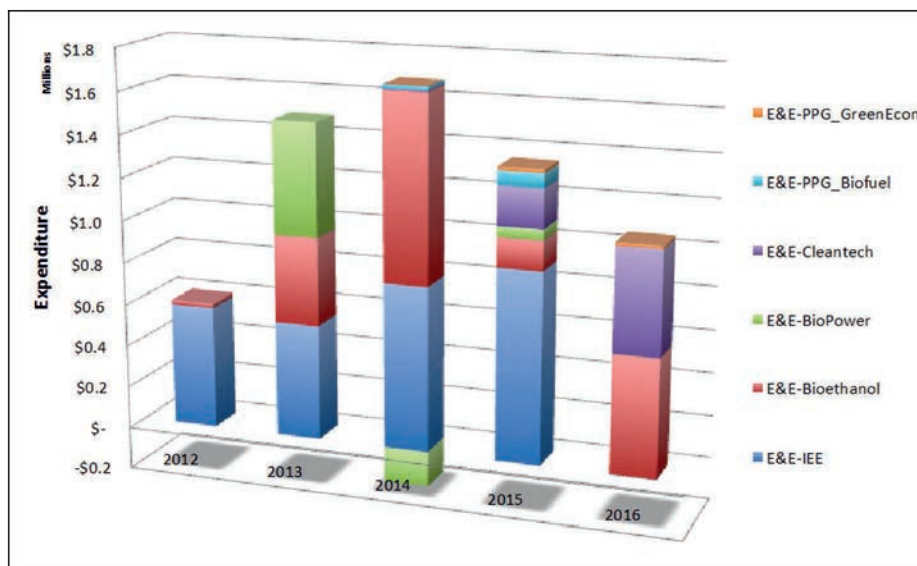


Figure 6. Annual breakdown of expenditure for the national GEF projects
Source: SAP Open Platform accessed on 12/05/2016

Figure 7 shows the percentage of the co-financing actually engaged on a yearly basis. Figures 6 and 7 provide an insight on the projects that were smoothly implemented compared to others that slowed down during certain periods.

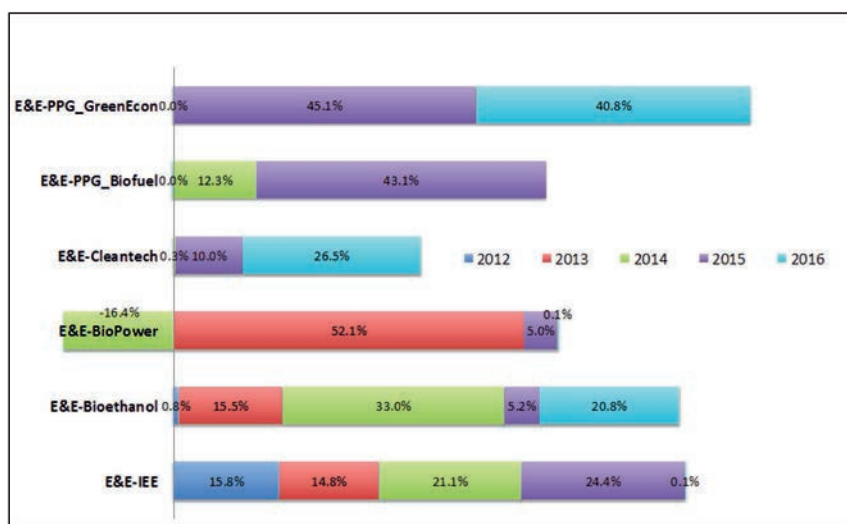


Figure 7. Percentage share of annual expenditure for the GEF projects
Source: SAP Open Platform accessed on 12/05/2016

4. Technical cooperation – evaluation findings

4.1 Poverty reduction through productive activities

a) TF/THA/09/004 - UN Joint Programme on Integrated Highland Livelihood Development in Mae Hong Son (Livelihood development)

Background

In response to the UN Millennium Development Goals, the Thai Government launched its own “MDGplus” aimed at achieving the goals sooner and at higher levels with attention to less advanced provinces. This Joint Programme was developed as a part of the UN Partnership Framework (UNPAF 2007-2011). Through concerted efforts among UN agencies, the programme supported the government’s efforts to reduce disparities and hence build a more equitable society, to empower the most vulnerable people in Mae Hong Son province and to build the capacity of people in responsible positions to fulfil their societal obligations. It was carried out through a three-pronged approach of improving the skills and therefore income generating capability of the target groups, improving the sustainable management of natural resources, and increasing the opportunities of the vulnerable populace to access social services such as health and education. The programme was financed by Japan through the United Nations Trust Fund for Human Security, and was implemented between 2007 and 2011.

Within the scope of the joint programme, UNIDO’s activities were focused on *enhancing productivity, diversifying the economic base and promoting small scale business enterprise development, thereby increasing income generation of vulnerable groups in underserved areas through capacity building and targeted skills development*. UNIDO’s activities were undertaken in close collaboration with key counterparts focusing on local capacity building and marketing activities for supported sub-sectors which are sugarcane, soybean, coffee, garlic, and textile & handicraft.

The project was subject to an independent terminal evaluation in October 2013. The findings presented in this report are mainly based on the conclusions of the terminal evaluation report and assessment by the country evaluation team of the follow-up of recommendations.

Relevance

The Programme was highly relevant and appropriate to the needs and aspirations of the main target population in Mae Hong Son province as well as to the national objectives of the Thai Government regarding the strategy for achieving the MDGs.

The Programme has addressed well the priority concerns and needs of its core target groups and communities. The core target groups and communities were identified through systematic surveys and studies and the technical interventions reflect a balance between the practical needs/opportunities for incremental development and the need to safeguarding the natural and cultural environments in line with the tenets of sufficiency economy. Moreover, the implementation approach facilitated effective participation of the target groups and communities as well as the provincial agencies, and the national ministries.

Design and ownership

The Programme was based on the concepts of sustainable livelihood development with emphasis on participatory community development, empowerment of the target communities and a multi-sectoral approach to address the development needs. The programme objectives are consistent with UN human security principles, and are relevant to the needs of the target groups and communities as well as to the policy priorities of the Mae Hong Son government. The programme offered a wide range of services and assistance, from agriculture, income generation, environmental conservation, access to education and health, including capacity building of the local communities and provincial agencies associated with the Programme. Further, the implementation approach reinforced measures for ensuring the relevance and practicality of the planned outputs and activities.

The programme design itself was broadly coherent, showing clear links between the objectives, outputs and activities, including elaboration of indicators and assumptions. However, definitions of the Outcome and other related results were not adequate to provide clear ideas on the results to be achieved. Since the Programme was intended to serve as a model for replication in addressing similar development needs within Thailand or other countries, there was a need for clearly defining the overall objectives to be achieved between the long-term Programme Goal and the short-term specific objectives. Moreover, the short-term specific objectives were not defined in clear and precise enough terms with appropriate indicators to enable verification of their realization.

The programme design was quite broad and complex, with a wide range of technical interventions in remote areas, involving many challenges such as the involvement of many stakeholders from the provincial government offices, UN agencies and the national implementing partners. The relatively small budget (US\$ 4.5 million) and the relatively short duration (3 years) to implement this programme involving much complexity and various constraints may be questioned.

The programme emphasized the importance of building partnership among the key implementers – both among and between the provincial agencies and UN agencies, through the creation of the Provincial Task Force (for the provincial agencies lead by the Vice-Governor), UNJP Task Force among the UN agencies and the Provincial

Steering Committee assisted by the PMU. This approach not only promoted efficiency in implementation but also contributed to generating a sense of ownership and cohesion among the target groups and communities, thus leading to their rapid acceptance of programme activities.

Efficiency

On the whole, the programme implementation was efficient in terms of implementing activities, delivering the planned outputs and reaching out to secure participation of all key target groups and communities. The participatory and bottom-up approach adopted in the programme was effective in mobilizing the target beneficiaries who actively participated in its implementation. Similarly, the provincial agencies responsible for implementation closely collaborated among themselves and with the UN agencies. The latter also overcame the complexity of joint planning and implementation, and established close working processes under the Common Operational Guidelines.

The Project Management Unit (PMU) functioned well under the coordination of the international programme manager and assisted in planning all the work, monitoring and reporting and ensured the management support functions. Following the departure of the programme manager, the responsibility was transferred to the province, which has failed to continue playing an active role in coordinating, planning and reporting. This has had an adverse impact on the quality of programme performance monitoring. For example, there is no data available to assess the programme outcomes, in terms of increased production and income earned by the beneficiaries.

Sustainability

The terminal evaluation noted that at the level of individual groups and communities, there were promising prospects for sustainability and they would continue to use and manage the projects and activities they had begun. The Programme appeared replicable with its clear conceptual design and practical approaches that have proven to be relevant and useful for the target groups and communities.

However, it also cautioned that many of the target groups and communities would require some form of external support to continue building their technical, institutional, financial and management capacities. It was feared that if there was no further support extended by the Programme, there were great chances that most of what had been achieved at the village level might be lost. Some uncertainties were foreseen as far as the programme was concerned. There was a need expressed for continued policy level support of the provincial government on the follow-up, including priority and funding for the programme's future. Uncertainties were also expressed regarding the technical and institutional capacity of the provincial government and other agencies. It was considered vital to maintain an effective PMU

that would provide a strong leadership in extending adequate support and guidance to the target communities. Similarly, it was felt necessary to have some form of external assistance, both financial and technical. On the whole, the terminal evaluation team felt at that time that it was premature to conclude if the programme had demonstrated its effectiveness convincingly. There was a need to have more systematic evidence to convince potential investors, especially financial institutions.

The current evaluation tried to assess how far the recommendations of the terminal evaluation team were followed up. Due to the limited time available, only a limited number of stakeholders could be consulted to learn about the progress that had been made beyond the official closure of the programme. It concurs that training provided in the programme was well designed and delivered to strengthen capacities of the institutions and communities associated with the programme. However, beneficiaries have only adopted those practices and equipment that suit their lifestyle. No further consolidation of the programme has been done, perhaps because the local government had not taken the lead to ensure coordination of all the activities initiated and to further widen the benefits to other groups and communities. Further support received by various local and central government agencies were mostly in the form of free tools and equipment whose use was far from optimal. This can be attributed to the fact that the Individual groups receiving such tools and equipment free of cost had not realized their value. Absence of any details regarding the additional economic benefits accrued by them led the country evaluation team to believe that the beneficiaries had not been well exposed to business models that could ensure overall sustainability of the programme.

The terminal evaluation report had recommended the formulation of a programme of consolidation during 2014/2015 with the assistance of the UN agencies, including the mobilization of necessary external assistance. The present evaluation team learned about the follow-up mission by the Food and Agricultural Organization (FAO) in May 2015 to assess the status of the various initiatives but no concrete action has been contemplated by the UN agencies as far as the consolidation of the programme is concerned.

Since the completion of the programme, there have been no further interactions between UNIDO and the local authorities as well as the individual target groups. Further, no efforts have been made to replicate the experience to benefit larger groups of individuals and communities in the province. Hence the overall effectiveness of the demonstration efforts made in the programme can be considered as limited.

Programme management and implementation

The terminal evaluation was focused on the overall programme management and not so much on the performance of the individual UN agencies. The programme management was found to be satisfactory. Decisions were taken in a timely manner

by the Programme Advisory Board (PAB), co-chaired by the Ministry of Interior and FAO on the programme extension and transfer of programme management to the provincial government. The project operation at the provincial level was led by the Provincial Steering Committee (PMU), which facilitated the coordination of implementation work among the numerous actors. The PMU played an important role by ensuring that the programme implementation followed the appropriate methodological procedures, such as conduct of needs assessment, operational procedures and monitoring and reporting on implementation progress, including the conduct of the Internal Mid-term Review in 2011. However, once the Programme management was handed over to the Provincial Government late in 2012, the PMU lost much of its dynamism and leadership role and became almost non-existent.

The programme management was deemed to be satisfactory as the planned activities and outputs were delivered largely in timely manner in spite of the complexity of programme implementation and logistical constraints to reach out to the target groups in remote areas. Considerable efforts were made to enhance both the implementation efficiency and effectiveness, including systematic use of some methodologies and practices such as good planning approach, target group formation, favouring local collaboration, building partnership among the key implementers, generating sense of ownership and cohesion among the target groups and communities.

4.2 Trade Capacity Building (TCB)

Since 2008, The Trade Capacity Building Branch of UNIDO has completed two TCB projects in Thailand more or less during the same time period, both with co-funding from the European Union. Both projects are quite small in size and budget and were carried out over a fairly short time frame.

The first project was about “Upgrading of the technical and personnel capacity of the target Thai chemical testing laboratory” which was implemented from August 2008 to October 2010. The second project dealt with “Trade capacity building in Thailand through strengthening the capacities of the testing laboratories for food and agricultural products” and was implemented from December 2008 to October 2010.

Because the individual projects were relatively small, no terminal evaluation had been conducted for these projects. The task of the country evaluation was to assess to what extent and how the upgraded laboratory facilities have been used and how effective has been UNIDO’s overall contribution to the development of quality infrastructure.

a) XP/THA/08/001; EE/THA/07/002; US/THA/07/001 - Upgrading of the technical and personnel capacity of the target Thai chemical testing laboratory

Background

The overall objective of the project was to upgrade the technical and personnel capacity of three target laboratories:

1. Department of Science Services – Chemical Programme (DSS)
2. Thailand Institute of Scientific and Technological Research (TISTR)
3. Thailand Textile Institute (THTI)

These laboratories were expected to play an important role in supporting the importers and consumers in the EU so that the latter could preserve commodity sources as well as varieties available to them, while enjoying enhanced protection of human health and environment.

The following results were expected from the project, which would help in achieving the above objectives:

- Preparation of a detailed list of products, chemicals in products and identification of testing methods for each target laboratory.
- Upgrading of laboratory equipment to meet REACH requirement
- Training of at least 6 laboratory staff
- Getting international accreditation (ISO17025) for the identified parameters and testing methods relating to REACH.

Six products were identified as important export products to the EU: Textile, Leather, Furniture, Packaging, Painting and various articles such as Toys. For each product identified, a national expert was assigned for the identification of the chemicals contained in products and testing methods. The duration of the study was from November 2008 to October 2009. The lists of chemicals contained in target articles were prepared from the chemicals in REACH's Substance of Very High Concern (SVHC) and Restricted Substances lists.

Laboratory equipment needed to meet REACH requirement were identified and purchased by the target laboratories and the equipment suppliers provided hands-on training. Several training sessions were organized for the identified test methods by using the purchased equipment.

With the acquired testing capabilities, THTI was able to organize a training course on "Legal Requirements and Restricted Substances Testing" for 4 scientists from Vietnam Textile Research Institute (TRI) in December 2010. THTI was also able to carry out testing for Ecolabels (for EU Flower and other Green Labels). THTI developed "REACH for Textile Manual" for textile producers, providing

comprehensive information on REACH, which was published in 2010. Further, THTI experts were invited as speakers for various industrial meetings.

DSS was able to receive accreditation from Thai Industrial Standards Institute (TISI) and both TISTR and THTI from Thai Laboratory Accreditation Scheme (TLAS). TISI and TLAS are the signatories to the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Arrangement (MRA), and therefore the accreditation DSS, TISTR and THTI received is internationally recognized. The management of the target laboratories sees the importance to support industries and SMEs through the accredited testing and has made commitment to support accreditation.

Current situation

The current evaluation found that the project had been effective in building the capacities of the target laboratories, which in turn were better positioned to extend services to their customers. For example, TISTR shared with the evaluation team information regarding the revenue they were able generate in 2014 by making best use of the upgraded laboratory equipment and trained laboratory staff, and providing service to their customers dealing with vehicle industrial paints (see Figure 8).

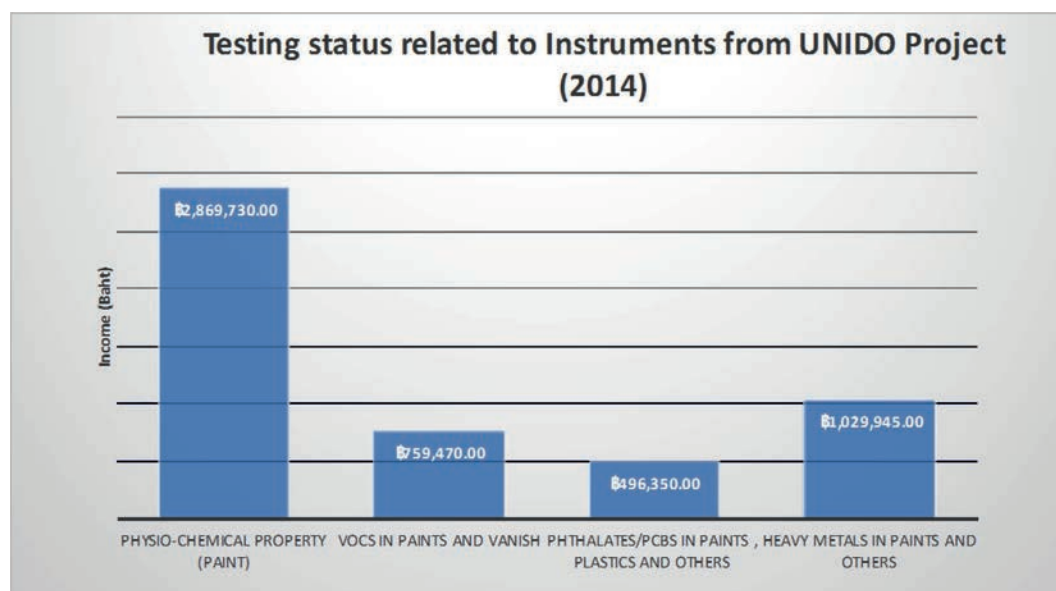


Figure 8. Revenue generated from testing activities in 2014. Source: TISTR

The planned outputs were delivered. The original implementation time of 18 months was rather short and had to be extended by a few more months. The political instability in Thailand during a few months in the first half of 2010 caused some delay in preparation and conduct of some training. As a consequence, the training

activities had to be postponed until stability was regained in the country. There is a high degree of satisfaction among the target laboratories. However, the project had to be terminated before meeting fully the needs of the industry.

All target laboratories confirmed having gained knowledge, tools and expertise, and expanded the scope of the services delivered to the industrial customers. Moreover, the project has contributed to the creation of a more competitive market for testing services in Thailand. They were also in a position to assist the laboratories in building and strengthening their capacities. On the negative side, the target laboratories had not made any efforts to quantify the financial benefits of their activities on enhanced trade with the EU. Some beneficiaries lamented the absence of further interaction with UNIDO after the completion of the project, particularly in matters pertaining to further developments in relation to REACH regulation that would help them enhance trade relations with the EU. There was also a general perception of UNIDO being a “donor” rather than an agency that had the necessary expertise to provide technical assistance for trade capacity building.

b) TE/THA/10/001; TE/THA/10/002; EE/THA/08/003 – Trade Capacity Building in Thailand through Strengthening the Capacities of Testing Laboratories for Food and Agricultural Products

Background

The overall objective of this project was to enhance the efficiency and competitiveness of Thai food industry, in particular in the EU market. The target group of the action was the National Food Institute (NFI), which is a non-profit independent network organization of the Ministry of Industry, responsible for promoting and developing Thai food industry by enhancing its efficiency and competitiveness through various services. The final beneficiaries are Thai entrepreneurs/exporters in the food industry, comprised of 9,000 food-processing factories with 600,000 employees, benefiting from strengthened NFI capacity to support the food industry.

In order to achieve the set objectives, the project focused on strengthening:

- The food testing capacities and calibration technique of NFI personnel;
- The capacity of NFI to produce reference materials and to conduct efficiency assessment of laboratories; and
- The laboratory training capacity of NFI.

Further, the target of the project was to mobilize the trained NFI trainers for enhancing the capacity of technical personnel in laboratories of neighbouring countries such as Cambodia, Lao PDR and Vietnam. This is to reflect the recent needs

of and constraints faced by the food industry in Thailand. While many food-related enterprises are shifting their production sites to neighbouring countries, the testing capacities and skills in these investment recipient countries are often not at a level required by Thai standard. This initiative would contribute to strengthening the regional supply-chain network, thus enhancing the dynamic economic development in Mekong region as a whole.

The project was officially launched in December 2008, but the effective implementation commenced only after September 2009. This delay was mainly due to the change of government that resulted in a budgetary constraint for NFI, and all project activities had to be halted till the project budget was revised downward without compromising the planned outputs. As a result of this delay in the starting of the project, the contractual project implementation period was extended to 23 months until the end of October 2010. Hence, the effective implementation period was only 13 months, instead of the originally planned 18 months. Further, the project faced some delays due to the political disorder during the first half of 2010.

By the time the project came to an end, NFI had managed to carry out all the following activities:

- Upgrading the laboratory equipment and obtaining local accreditation;
- 5 training workshops on chemical testing, microbiology testing, calibration, production of reference materials and proficiency testing;
- 3 “Train the Trainers” courses on chemical testing, microbiology testing and calibration;
- 3 pilot training sessions conducted by trained NFI trainers on chemical testing, microbiology testing and calibration;
- Study tour of 5 selected NFI laboratory personnel to food testing laboratories in Europe;
- Participation of NFI to European proficiency testing; and
- Proficiency testing conducted by NFI.

Current situation

In spite of the budgetary constraints and time delays, the project managed to produce visible and positive outputs, thanks to NFI’s effective cooperation and strong sense of ownership and active involvement in the project activities. Though the planned outputs could not be fully delivered due to budget constraints, they have not affected the capacity of NFI to perform the expected duties.

The current evaluation team was able to visit the excellent laboratory facilities and discuss with the NFI staff about the benefits they had gained through the project. NFI

appreciates well the support received through UNIDO in the form of training of staff, upgrading of laboratory equipment and obtaining domestic accreditation. Learning from the project, NFI has mobilized resources to further strengthen their own capacities as well as that of their testing laboratories in order to support their clients. Though there have been changes at the senior management level, NFI continues to sustain the activities that were initiated with UNIDO support. Further, NFI is continuing to play an important role of supporting the capacity development of personnel and laboratories of the neighbouring countries in order to strengthen the regional supply-chain network and enhance the dynamic economic development in the Mekong region.

4.3 Environment and Energy

a) GF/THA/11/001, XP/THA/11/002 – Industrial energy efficiency in Thailand

Background

Despite encouraging efforts in terms of regulatory policy framework, establishment of energy conservation funds, tax benefits and other incentives from the government, realization of energy efficiency initiatives by the Thai industries to address the high energy consumption situation had been rather low with limited penetration of energy-efficient measures, technologies, and practices in the industries.

Decades of international experiences with industrial energy efficiency programs have shown that most energy efficiency in industry is achieved through changes in *how energy is managed* in an industrial facility, rather than through installation of new technologies. The goal of sustainable energy efficiency in industry requires that energy efficiency be integrated into daily management practices and systems for continual improvement. For this, top management needs to be engaged in the management of energy on a continuous basis

In order to address the above challenges faced by Thai industries and learning from the international experiences, the objective of the project is to enhance the energy performance of industries and make their operation more reliable and competitive through the adoption of energy management system standards incorporating industrial energy systems optimization approach. The project, being executed in collaboration with the Ministry of Energy and the Ministry of Industry, has received financial support from the Global Environment Facility (GEF) of USD 3,620,000 and co-financing from Thai government partners and private sector of USD 15,645,000.

Following are the main expected outcomes of the project:

1. Increase the awareness and encourage industrial enterprises to adopt ISO compatible energy management standards that can lead to the realization of continuous energy savings;
2. Create a cadre of energy efficiency professional within the industrial facilities as well as consultants and suppliers who can be instrumental in initiating a process to transform local markets effectively and to provide industrial system optimization services;
3. Ensure greater access to financial and institutional support for industrial energy efficiency initiatives; and
4. Demonstrate energy savings in participating factories through system optimization (SO) and increase the adoption of energy management standards by industries.

The project was officially launched in April 2011 with an initial target to be completed by August 2016. Based on the progress made in the project, the closing date is now extended by a year. Following the GEF Monitoring and Evaluation Policy for full-size projects, a mid-term review (MTR) of the project was conducted in May 2015.

The MTR found the overall project design to be relevant to the national energy priorities. The project is relevant to UNIDO policies and fully relevant to the GEF focal area of climate change. The participation of local stakeholders during the project design phase was also found to be strong. Incidentally, the project forms an integral part of overall UNIDO efforts to promote energy management and systems optimization in Southeast Asia, including Malaysia, Thailand, Indonesia, Philippines and Vietnam and Myanmar. There is therefore a great scope for exchanging ideas and experiences among the countries. Moreover, the training programs follow a similar proven setup that can be adapted to local circumstances and language, as and when needed.

The Logical Framework, with its outcomes, outputs and target indicators, is well developed, allowing for the monitoring of project results. The Project Document has also outlined well the M&E process and specific reporting requirements. The budget provided for M&E at the planning stage is sufficient. One of the drawbacks of the project design is the non-consideration of certain aspects such as institutionalization of the peer-to-peer network and training initiatives to ensure their smooth functioning beyond the project's life.

As far as the project's effectiveness is concerned, the training activities undertaken to ensure the first 2 outcomes are highly satisfactory, even exceeding the set target in some cases. Activities to achieve the Outcome 3 have just begun with surveys and interviews to assess the training needs and look for harmonizing the evaluation criteria to be adopted for extending Energy Efficiency (EE) loans.

Progress in Component 4 has been significant and is rated satisfactory. Of the target of 75 SO assessments, 26 have been completed, 8 are pending and 10 more were planned for 2016. Similarly, of the end-of-project target of 200 adopted Energy Management System (EnMS) plans, 24 have adopted plans, while 10 more are planned. Although the project is lagging behind in terms of achieving targets, it should be noted that implementation had to wait until the first training sessions were organised and more results will come in 2015-17 as the National Experts will perform more SO assessments and draft EnMS plans.

Project management is considered to be effective, assured by the UNIDO Project Manager as well as the Project Coordinator based at the Project Management Unit (PMU). Progress reports highlight well the various achievements of the project with narrative link back to the outcomes, outputs and targets as elaborated in the logical framework. The key project partners (DEDE, DIP, DIW and TISI) have collaborated well and have worked closely with the PMU. The Project Steering Committee (PSC) has been playing an important guiding role and a Working Group has been set up. The project was delayed during the start despite having mobilized counterpart resources and having in place adequate project management arrangements at project entry. The project implementation now seems well on track and should not face any difficulty to complete all activities by August 2017.

The mid-term review did not find any major financial, socio-political or institutional and governance risks to sustainability of the project. Technical risks associated with the optimization of compressed air and steam systems are very low. In fact, system level energy opportunities have been addressed by mostly the large industries to achieve considerable energy savings. Incidentally, larger companies have, in general, got exposed to similar management standards (e.g. ISO environment or quality standard). Involving medium and small sized companies to adopt similar practices is likely to be a challenge in the future.

Current situation

The country evaluation team had the opportunity to meet the key stakeholders and witness their strong commitment and very active participation. The progress made by the project is highly satisfactory due to the timely progress of project activities. Both the quantitative and qualitative outputs are appreciable. The project management team has been playing a very proactive and effective role. Suitable monitoring mechanisms have been adopted to gauge the progress made by the project. Interaction with the financial beneficiaries from the industry showed that they are very happy with the project approach that has led to tangible improvements in their industrial performances. The discussion held with the experts engaged to promote financial and institutional support was very fruitful, proving that they had a good knowledge of the market mechanisms that are suitable in the Thai context.

On the flip side, there could have been more vibrant inter-ministerial cooperation leading to greater synergies instead of having parallel initiatives by the different ministries. The involvement of the Ministry of Energy in the project is minimal whereas the same Ministry has been in charge of promoting industrial energy efficiency for more than 2 decades using various approaches including “total energy management” and “energy management systems”, etc. Moreover, the Department of Alternative Energy and Energy Efficiency (DEDE) under the Ministry of Energy has excellent facilities for theoretical and practical training, and technology demonstration centre displaying innovative technologies that can lower the energy consumption and cost as well as the adverse impacts on the environment.

Another drawback of the project is the mismatch between the project focus (large industry) and the focus of the main government partner (SMEs). The overall approach to promoting energy management system and the whole systems approach may be well suited to larger industries while more innovative approaches may have to be contemplated to address the types of challenges faced by SMEs.

On the whole, the project shows great promise in achieving the intended impacts and sustainability if the project team is able concentrate on evolving innovative mechanisms to address the needs of SMEs prior to the completion of the project, subject to the availability of budget.

b) GF/THA/12/001/A01, XP/THA/12/002, GF/THA/10/006, XP/THA/10/005 – Overcoming policy, market and technological barriers to support technological innovation and South-South technology transfer: the pilot case of ethanol production from cassava

Background

In response to GEF call for support under its climate change window, UNIDO and NSTDA (Thailand) collaborated to develop a concept note seeking an opportunity for GEF support to transfer Thailand’s bioethanol technologies to neighbouring countries. The project “Overcoming policy, market and technological barriers to support technological innovation and South-South technology transfer: the pilot case of ethanol production from cassava”, was designed as a four-year full-size project (FSP) as a part of the GEF-4 Technology Transfer Pilot (TT-Pilot) project. The full-size project is being implemented by UNIDO with financial grant from the Global Environment Facility (GEF).

The overall objective of the project is to remove barriers, and create a conducive environment for promoting ethanol technology and South-South technology transfer, thus contributing to the reduction of GHG emission thanks to increased use of ethanol as fuel in Thailand and LMV countries. The project was expected to be

executed in collaboration with the National Science and Technology Development Agency (NSTDA), with financial support from the Global Environment Facility (GEF) of USD 2,600,000 and co-financing from several government partners and private sector of USD 31,623,000.

Following are the main expected outcomes of the project:

- Enhance the capacity of NSTDA, Thailand to lend sustainable support to the region;
- Create conducive environment to promote bio-ethanol technology and strengthen policies to promote ethanol for replacing conventional fuels; and
- Strengthen technological and technical cross-border cooperation and improved investment climate in Thailand and LMV.

The project was officially launched in June 2012 with an initial target to be completed by October 2015. Based on the progress made in the project, the closing date was extended by a year. Following the GEF Monitoring and Evaluation Policy for full-size projects, a mid-term review (MTR) of the project was conducted in February-March 2015.

The MTR found the project design to be weak as it was prepared without full and active participation of relevant national stakeholders and with a lack of insight regarding CO₂ emissions abatement. As a result, the Project Results Framework (PRF) and target indicators were not developed well enough to address the key barriers and the associated risks. It was recommended to revise the PRF in consultation with all key stakeholders in order to come up with more realistic and achievable outputs and target indicators. Further, it was suggested that the revised PRF be approved by the Project Steering Committee (PSC) in close consultation with the GEF Coordination Unit and UNIDO Office for Independent Evaluation.

The project was adjudged to be relevant to the national development and environmental priorities of the countries concerned. The project was also found to be in line with UNIDO's mandate and was consistent with the GEF Climate Change focal area strategic program SP4: Promoting sustainable energy production from biomass.

At the time of MTR, the project had not achieved any of the planned outputs that would lead to the project outcomes. While a part of the delay in project execution could be attributed to reasons beyond UNIDO's control, the inordinate delays and inadequate project performance were attributed to the poor quality of the work plan and insufficient tracking and monitoring of the project's performance. Some partners identified in the project document had not been involved actively in the project.

The project implementation was delayed 2 years due to change in the main executing partner, political turmoil in Thailand and the delay in signing of sub-contract between UNIDO and the main executing partner. There is very little UNIDO could have done to avoid these delays. However, after the project got started, not enough efforts were made by UNIDO and its main executing partner to ensure the project's cost-effectiveness. The MTR found that while substantial GEF resources had been engaged, none of the outputs had been delivered and very little confirmed co-financing had materialized.

As far as the project sustainability is concerned, while the participating governments realized the importance of bio-ethanol development, coordination among key government agencies was a pre-requisite for the formulation of transparent policies and required incentives. Other key stakeholders could be expected to fall in line once a strong policy signal was received from the government. The MTR concluded that while there were no identified potential risks to environmental sustainability, the project had not been effective in sharing the Thai experience of bio-ethanol promotion initiatives with the neighbouring countries.

The M&E was well designed, however it was not followed during the project execution. The SMART indicators specified in the M&E design were not reflected in the project monitoring and supervision scheme. Moreover, there was no comprehensive adaptive management strategy to cope with the delays in project timeline and delivery of outputs. The project team had not consulted all the project partners while developing the work plan, the timeframes proposed were not precise, and there was no clear indication of the milestones to be achieved and the sequence of activities for the timely delivery of outputs.

Some deficits were observed in UNIDO supervision and backstopping. In view of the delays in project execution due to reasons beyond UNIDO's control, the PMU was expected to be more vigilant and proactive in monitoring the project performance and tracking the progress towards milestones instead of transferring such responsibilities to the main executing partner.

Current situation

The country evaluation team had the opportunity to discuss with the key stakeholders and get an update of the progress made since the Mid-Term Review (MTR). Recommendations of the MTR are being implemented though the pace is a little slow. A full-time project coordinator has been appointed to improve project management and adopt a more effective mechanism to create synergy among the key actors, putting in place a monitoring system that would keep track of the progress made in the project, and establish a PSC with improved structure. As the project coordinator was appointed only a few weeks before the current country evaluation, it

is too early to assess the progress of the project since the MTR. The main project partner raised the issue about the reporting mechanism and the ambiguity in the roles and responsibilities shared between the PMU and the UNIDO HQ.

c) GF-100258, XP-100258, GF/THA/10/004, XP/THA/10/003 – Promoting small biomass power plants in rural Thailand for sustainable renewable energy management and community involvement

Background

The Thai government has formulated the National Renewable Energy Master Plan that aims at increasing the share of renewable energy in the country's total energy mix from 6.4% to 20.3% by 2022. Thailand has abundant biomass resources, including solid biomass from agriculture, and a potential to generate up to 4,400 MW of electricity using biomass. So far around 1,600 MW of electricity is being generated from biomass, leaving a huge potential to exploit the untapped biomass resources.

The Forest Industry Organization (FIO) is a state-owned enterprise that has conceptualized the "One community – One plantation – One biomass power plant" initiative with a goal of setting up small-scale biomass power plants in 99 plantation sites in 28 provinces. The idea is to involve the local communities that will take the lead to plant fast growing trees and use the waste wood as fuel for small biomass power plants at the community level. However, several barriers need to be addressed to transform the above concept into reality. These include technical capacity and entrepreneurship skills, biomass technology, learning platform and financing.

The project was developed to address the above barriers and strengthen as well as complement FIO's on-going efforts in important areas: (1) the holistic management of a biomass-based on-grid small biomass power plant with active community participation; and (2) replication of community-based biomass power plants in rural areas of Thailand. More specific outcomes of the project include:

- Installation and sustainable operation of on-grid small biomass power plants;
- Capacity building of communities so that they are able to replicate and adopt community-based wood-fired power plants; and
- Changing policy to promote community-based biomass power plants.

The project got GEF approval to be implemented as a medium-size project with a grant of US\$975,000 and an additional government and private sector commitment of US\$ 3 million. The implementation work started in February 2013 with August 2015 as the official closing date. In view of the delays in the execution of the project, the 3rd PSC meeting has recommended to extend the project duration till the end of 2016.

Status of implementation

As far as the commissioning of the 250 kW power plant was concerned, the Science and Technology Research Institute (STRI) at Chiang Mai University (CMU) has completed the following items:

1. Identification of site for the proposed biomass power plant;
2. Survey of the site and specification of the location of the power plant building;
3. Design of the power plant building and estimation of the construction cost;
4. Preliminary estimation of the cost of the power distribution network.

As for the commissioning of the 1 MW power plant, CT Power Engineering Company (CTP) that was expected to invest in the project has backed out due to the grid connection challenge. The project stakeholders have agreed to look for a new investor to develop the 1 MW power plant. UNIDO on its part has completed the application form, application criteria, and guidance of selection and sent it to steering committee for consideration.

As a part of the technical and institutional capacity building, it is planned to establish an information and learning centre on small-scale biomass gasification at STRI, CMU. A conceptual model for the learning centre has been studied and STRI staff has undertaken visits of several community-owned small-scale power plants to gather useful information and learn from the experiences. As the information and learning centre is yet to be established, no activity has been taken up so far to train the centre staff on the technical and the operation and maintenance (O&M) aspects of small-scale biomass gasification plants. Likewise, no training material has been developed for the different types of training to be conducted at the information and learning centre. Also, no information toolkit has been prepared for the agro processing industries on developing small-scale biomass gasification power plants.

As far as the activities to be undertaken for encouraging the participatory process for the promotion and support of community owned small-scale biomass power plants up to 1 MWe capacity, the following activities have been completed by STRI:

1. Conducting public awareness on small-scale biomass power plant to promote community owned biomass power plant models. The awareness focused on the advantages as well as operation and maintenance aspects of small-scale biomass power plants.
2. Introducing a viable business model for the sustainable operation of community owned biomass power plant as a part of public awareness activities. This has helped the communities to better appreciate the profit and

community benefits resulting from the successful operation of the community owned biomass power plant operation.

In terms of policy to promote replication, Phrae province has plans to establish one small-scale biomass power plant annually in the next 5-years under the energy development planning policy.

Relevance

The project is expected to contribute to Thailand's commitment to achieve the national renewable energy target and reduce the GHG emissions. This is also reflected in the revised Power Development Plan of the national power generator; the Electricity Generating Authority of Thailand (EGAT) aims to increase its share of renewable energy sources in the energy-mix of power generation. Moreover, the project is aligned with the goal of the National Energy Committee to promote Very Small Power Producers (VSPPs) using renewable energy sources and with installed capacity less than 1 MW. The added-on incentives for each unit of electricity sold to the grid by VSPP are a good way to encourage more community-based and small-scale power plants in remote areas using either agricultural waste or fast-growing trees as fuel.

UNIDO is well placed to implement this project because of its experience and expertise in dealing with modern biomass technologies and renewable energy based mini-grid projects. The project is consistent with the Strategic Programme 4 of GEF that aims at promoting sustainable production and consumption of biomass in rural areas. Moreover, GEF Council Paper "Comparative advantages of the GEF agencies" recognizes the comparative advantage of UNIDO leading this strategic programme.

Design and ownership

The project design is generally good and there is a strong ownership of the Ministry of Energy that happens to be the main institutional partner.

While the project design is good, it seems to have overlooked some risks that may prevent the project outcomes to be achieved. And while some risks were identified during the project design, not enough care has been taken to involve the stakeholders who could help minimize the risk. A consultation process during the project development phase could have helped identifying the various players who should be engaged in the project to guarantee the project's success not only during its execution but its long-term positive impacts.

One example is the exclusion of the Provincial Electricity Authority (PEA) which is the body that handles the transmission and distribution of electricity in all areas outside the metropolitan zones. While the project team was busy conducting activities and creating awareness of the population in the village that was identified as the site for the 250 kW biomass power generation, PEA informed UNIDO in October 2014 that the demonstration power plant could not be developed because there was no feeder available in that area. Had there been proper coordination and collaboration with PEA right from the start of the project, such a situation could have been anticipated or avoided altogether much earlier than after over one and half year of the start of the project.

The project is facing another new challenge; it is regarding the land-use policy of the Ministry of Interior that will hamper the development of the project at the new site selected after PEA expressed its inability to provide access to the local grid at the site first selected by the project.

Efficiency

There has been considerable delay in comparison to the initial timeframe set for the project execution. The delay can be partially attributed to the re-organization of the Ministry of Energy with the change of the Central government. Several barriers were encountered during the project implementation, hampering the achievement of the expected outputs. Some of these drawbacks could have been avoided by identifying and involving some of the stakeholders that have been left out in the project.

There was also the resistance from the local community to build a biomass-based power plant in the initial phase of the project. While 2 PSC meetings were held within a very short span in June and July 2013, the 3rd PSC was held 20 months later at the end of March 2015, showing the absence of proper tracking and monitoring of the project's performance. Moreover, there is also a lack of project documentation. The 3rd PSC meeting discussed and agreed to extend the project duration whereas the August 2014 work plan of CMU shows activities lasting up to the end of 2016.

The PIR of 2014 rated the project implementation as moderately unsatisfactory but as required by the GEF procedure, no detailed progress report was available on actions taken to rectify the rating(s) and improve the overall performance of the project.

Effectiveness

The project has yet to achieve the main planned outputs such as the commissioning of the community-based small biomass power plant or the 1 MW or the

establishment of the information and learning centre on small-scale biomass gasification.

As it is a medium-size project with a relatively small budget and short implementation time, it was important to plan the project activities well and have a good monitoring mechanism to keep the project schedule under control. Activities that are not linked to others could have been undertaken in parallel to save time and achieve the expected output in timely manner. For instance, activities related to technical and institutional capacity building for adopting small scale biomass gasification power plant could have been implemented in a timely manner as this component has not faced any practical difficulties like in the case of the development of the community based biomass power plant. But the learning centre structure has yet to be finalized even after more than 2 years of the execution of the project. Setting up of a more formal PMU and adoption of more stringent monitoring mechanism could have helped to achieve better results within the stipulated time frame.

Sustainability and impact

There is a strong will of the government to develop renewable energy in order to lower the dependence on fossil fuels. As reported by the project, other government agencies such as the Ministry of Science and Technology have also taken steps to set up 1 MW gasification based demonstration power plants in other parts of Thailand. Moreover, the Ministry of Energy that is the key institutional partner of the project is highly committed and is actively involved in overcoming the bottlenecks faced by the project.

The project's impact will largely depend on the capacity of the project partner to bring on board the key stakeholders who can be instrumental in removing some of the barriers hindering the project's progress. The sustainability of the project will also depend on what type of policy changes are recommended based on the lessons learned by the project in order to promote sustainable development of community managed small-scale biomass power plants.

d) GEF-130312 – Promote the demonstration, deployment, and transfer of innovative low-carbon technologies

Background

Taking into account the increased need to accelerate the pace of clean energy technologies innovation and adoption globally, the GEF and UNIDO have agreed to develop a global flagship Cleantech programme which is in line with the GEF Council's Revised Strategy for Enhancing Engagement with the Private Sector,

Modality 3, namely “SME Competition Pilot: Encouraging Entrepreneurs and Innovators.” This strategy, in particular, provides support to entrepreneurs and innovators seeking to establish commercial ventures in the field of clean technologies.

The Thai economy is based on industrialization strategy, liberalized trade, and investment policies. As a result, the country was able to meet most of the Millennium Development Goals (MDGs) at the national level and is now preparing to go beyond that. With promotion of clean energy technology innovations and organization of the national innovation and acceleration programmes for SMEs, Thailand will not only support SMEs in entering the ASEAN Economic Community (AEC), but also achieve and go beyond its development targets.

However, there is a lack of policies or regulatory frameworks to promote clean energy technology innovations in Thailand. Although Thailand has established some policies, most of them are not focused on innovations for SMEs innovators and entrepreneurs.

Several barriers need to be addressed before Thailand is able to successfully organize the national innovation and acceleration programmes for SMEs. These include

1. Lack of technology innovation platforms specifically tailored for and targeted to clean energy technologies and to SMEs;
2. Low contribution and dynamism of SMEs in clean technologies innovation and relevant market transformation and economic growth;
3. Limited awareness of financial schemes, requirements and procedures to access financing for clean energy investment projects and limited government financial incentives to support industrial enterprises in the uptake of innovation in clean energy technologies;
4. Lack of trained experts for mentoring startups and entrepreneurs actively involved in cleantech innovations;
5. Lack of coordination amongst sectoral players on market intelligence research;
6. Lack of an enabling regulatory environment that actively supports innovations in SME clusters;
7. Lack of examples and insufficient dissemination of success stories of SME led technology innovation, leading to persistent low attention to change and to high-risk/capability-gap perception.

To contribute to mitigating the above barriers in a holistic manner, the project aims at promoting clean energy technology innovations and entrepreneurship in selected SMEs in Thailand through cleantech innovation platform and entrepreneurship acceleration programme. Following are the three main outcomes targeted to fulfil the main objective:

- Establishment of a National Cleantech Platform to promote clean technology innovations and business models in SMEs in Thailand;
- Development of Institutional capacity building for clean technology innovations; and
- Strengthening of policy and regulatory framework for scaling up of Cleantech competition, innovation and acceleration activities across Thailand.

The GEF support for the project amounts to US\$2 million while the co-financing pledged by national government agencies amounts to US\$4.2 million. The project got approval from GEF in June 2014 for implementation over 36 months.

The Global Cleantech Innovation Programme for SMEs

This programme is focused on enhancing both emerging cleantech startups in all participating countries and the local entrepreneurial ecosystem and policy framework. The programme follows a competition-based approach to identify the most promising entrepreneurs across each country while a local acceleration programme supports, promotes and “de-risks” the participating start-ups and connects them to potential investors, customers and partners. The best startups from each country are brought together for the finals of the global competition which is held once a year in Silicon Valley, California, where they compete for the Global prize and connect with potential partners, customers and investors around the world.

An integral part of the programme is the institutional capacity of local implementing partners, which are typically government agencies focused on SME development, clean technology and innovation. The programme seeks to reinforce, strengthen and connect existing in-country activities than duplicate existing activities.

Status of implementation

In November 2014, the Department of Industrial Promotion (DIP) was assigned by the Ministry of Industry to be the executing agency of this project. The first Project Steering Committee (PSC) meeting was held in February 2015. The Chair of the PSC informed that due to the changes in Thai government policies, the Thai Cabinet must approve the agreement between UNIDO and DIP. At the time of country evaluation, the project document had just been sent for Cabinet approval and a decision was expected in December 2015. As a result of the delays, Thailand will not be in a position to participate in the 2016 Global Cleantech innovation Programme.

As far as the project’s design is concerned, clean energy technologies developed and promoted as a result of the innovation competition and the accelerator programme will lead to reductions in overall national GHG emissions, and will contribute to

Thailand's sustainable green growth thereby addressing a global issue of climate change and national issues of energy security, employment creation and competitiveness of SMEs.

The objective of the project is fully consistent with the goal of GEF's Climate Change Mitigation Focal Area, which supports developing countries and economies in transition toward a low-carbon development path, and in particular with Objective 1 of the GEF Climate Change Mitigation Framework, namely "Promote the demonstration, deployment, and transfer of innovative low-carbon technologies."

As far UNIDO's participation is concerned, UNIDO's mandate is to promote technology transfer, technology development and deployment in developing countries. One of the current three thematic priorities of UNIDO programme is sustainable energy and environment. Moreover, the project is line with the approved UNPAF 2012 - 2016 (United Nations Partnership Framework, Thailand 2012-2016) which emphasizes the management of natural resources and the environment towards sustainability as one of the key development strategies agreed upon with the Royal Thai Government.

As far as the country ownership in designing of the project is concerned, UNIDO has series of meetings with the Department of Industrial Promotion (DIP) prior to the submission of the proposal to GEF for CEO endorsement. Two stakeholders meetings were organized with the participation of the key stakeholders, namely DIP under the Ministry of Industry, Industrial Technology Assistance Program (ITAP) under the National Science and Technology Development Agency (NSTDA), Kasetsart University and the private sector. These meetings allowed to identify the roles that each of these stakeholders can play during the implementation of the project.

Hence, the project can be considered as being well aligned with the national policies of Thailand and the GEF focal area priorities, and with a high degree of ownership of the key stakeholders in Thailand.

Since the project has not really taken off apart from the first PSC meeting held in February 2015, the Country evaluation is not really in a position to assess the project's efficiency, effectiveness, impacts, etc. at this stage. One can however note the impact of the change of government policy regarding the implementation of projects with support from international organizations. The project's sustainability and impact will very much depend on the dynamism of the main partner to get government approval and greater involvement of the key stakeholders through a consultation process.

e) GEF (PPG)-130319 – Reduction of GHG emissions from Thai industries through promoting investment in the production and usage of solid bio-fuels

Background

Thailand is a pioneer among Asian countries in establishing policies and undertaking projects and programs to promote RE. The Thai Government has formulated policies to promote the production and usage of liquid bio-fuels as an effort to deal with spiralling oil prices, which has led to the significant increase in the production and consumption of liquid biofuels. The government has developed a 10-year Alternative Energy Development Plan (AEDP 2012-2021) with the objective to increase the proportion of alternative energy from 7,413 ktoe in 2012 to 25,000 ktoe by 2021. Under the AEDP plan, biomass, biogas and municipal solid waste (MSW) are expected to increase, as compared to the existing capacity, by about 2 times (3,630 MW), 4 times (600 MW) and 12 times (160 MW) respectively.

Domestic usage of solid bio-fuel is yet to be widely accepted in Thailand due to the following barriers:

- (a) Inadequate demand and supply information on solid bio-fuel;
- (b) Inadequate information on existing projects;
- (c) Higher fuel cost compared to that of coal;
- (d) Lack of quality standards for the production and end-use of solid bio-fuel;
- (e) Reduction in feedstock quality during storage and transportation;
- (f) Lack of technical knowledge on co-firing and combustion system modifications for using solid bio-fuel;
- (g) Inadequate policy, regulatory framework and incentive mechanisms for production and usage of solid bio-fuels;
- (h) Lack of solid bio-fuel supply chain management; and
- (i) Uncertainty of biomass resources.

The project intends to overcome the above barriers by undertaking a number of activities that will lead to the following benefits:

- Awareness is raised and capacity built on production and usage of solid bio-fuel mainly through various campaigns, trainings and workshops;
- Favourable policy, regulatory and investment environment created on solid bio-fuel production and usage; and
- The necessary value chain for solid bio-fuel production is set up, promoting private investments in solid bio-fuel production and encouraging industries to technologically adopt fuel mixing and co-firing.

The Project Proposal Grant was received from the GEF and the project document is getting ready for submission to the GEF and commitments of co-financing are being secured. The project expects to receive a total support of US\$4 million from the GEF and a pledge of support amounting to US\$27.1 million from Thai government agencies and the private sector.

Status of implementation

After receiving PPG from GEF, UNIDO has taken the lead to carry out activities in partnership with the Ministry of Industry since March 2014 till date. These include, among others:

- Appoint a consultant to prepare the project document and undertake Logical Framework Analysis (LFA), analyse the risk associated with project implementation, undertake GHG emission calculations, develop ToR for external consultants and conclude studies undertaken them, and respond to GEF steering committee comments;
- Develop Work Plan and identify the activities to be implemented;
- Organize inception meeting with stakeholders to review and approve the work plan;
- Develop the draft application form of pellet producers and pellet users (for Heat and Power application) and announce the demonstration plant application;
- Review the applicants for demonstration pellet producing plants;
- Establish the “Working Committee for promoting the production and usage of solid biofuel in Thai industries” and conduct working committee meetings;
- Conduct and summarize various pre-feasibility studies;
- Identify and estimate the budget of the possible promotion and support for pellet producers and users;
- Draft and review the CEO endorsement document; and
- Submit the CEO Endorsement Document and Co-finance to the Cabinet of the Royal Thai Government (RTG) for their consideration.

Relevance

This project is being developed in support of the government’s AEDP. The aim is to promote the conversion of agricultural residues to energy through the production of densified biomass fuel, thus substituting fossil fuels by biomass in industries and power plants, and reducing GHG emission from the use of fossil fuels. The project will be developed in synergy with the Green Industry Initiative of the Thai Ministry of Industry, which aims at promoting sustainable development of the industrial sector by encouraging the manufacturing enterprises to continuously improve their production process and environment management, including the usage of clean and low-carbon fuels. The project will build on the experiences and achievements of several other projects initiated in Thailand to ensure that it is complimentary with them. The outcome of the project emphasizes the management of natural resources and the environment towards sustainability, as one of the key development strategies agreed by the Royal Thai Government (11th NESDP).

The proposed project is in line with GEF-5 climate change focal area strategic programme CCM-3: Promoting the investment in RE technologies. The project is a technical assistance/capacity development intervention that fits within the climate change focal area objectives CCM-3. The GEF Council paper “Comparative Advantages of the GEF Agencies” (GEF/C.31/5rev.1) recognizes the comparative advantage of UNIDO in this objective. The proposed project is in alignment with the approved UNPAF (2012 – 2016).

Design and ownership

The project is well designed as it is trying to clearly assess various aspects of the project before it actually starts so that the project activities can be focused on the real issues and barriers to be addressed for achieving long-term benefits. These include mapping of biomass resources, technologies needed to get good quality fuels, economics aspects involving both the producers and users, policies, regulation and incentive mechanisms that have been adopted in other countries, defining the roles and responsibilities of the key project partners and beneficiaries, etc.

The project does not display a strong ownership of the Ministry of Industry as it does not seem keen to lead the project. It is disheartening because UNIDO has made considerable efforts over a couple of years to establish close collaboration with all the stakeholders and a lot of activities have been undertaken and several consultative meetings were held since the PPG received for the project in 2013.

Based on the discussions held and the documentation shared with the country evaluation team, there is a general feeling that UNIDO is occupying the driver’s seat as a result of which the national counterparts tend to depend heavily on the initiatives taken by UNIDO. Such an approach may result in weaker engagement from the Thai partners. Moreover, MOI seems to be unduly concerned with the project viability because of the low prevailing fossil fuel price in Thailand. Due to the internal hesitation of MOI about whether or not to take up the project, the deadline for project document submission to GEF Council (November 2015) could not be however be met.

Efficiency

As mentioned above, UNIDO has been very proactive in providing timely support for the smooth progress of the project document. The outputs so far, both in quantitative and qualitative terms, have been impressive. All the questions raised by the GEF Scientific and Technical Advisory panel (STAP) have been considered seriously in order to find suitable answers.

Effectiveness

Since the main project has yet to start, it will be difficult to assess the effectiveness of UNIDO's intervention in terms of achievement of outputs and outcomes against their objectives. However, the activities undertaken so far show the numerous benefits that can be expected from the implementation of the project.

Sustainability and impact

The Thai government has demonstrated a strong will to support the promotion of biomass as energy sources in order to lower the dependence on fossil fuels. Also, the Department of Alternative Energy and Energy Efficiency (DEDE) under the Ministry of Energy has prior experience in setting up a Demonstration plant of pellet utilization in Small Boiler. Hence the main focus should be the long-term objective of the Thai Government to lower the dependence on imported fossil fuels and the emission of GHGs instead of focusing too much on the commissioning of the pilot project.

From that perspective, it seems imperative to consider how biofuels can remain competitive with the fossil fuels being replaced at all times irrespective of the fluctuating fossil fuel price in the international market. From the discussion held with MOI, the country evaluation team got the impression that the Thai counterpart agencies are not sure whether to go ahead with the project because solid biofuel is not at all competitive with the present low fossil fuel prices. The challenge for the project is to come up with the right policy that ensures the competitiveness of the biofuel at all times as has been so well demonstrated by the Thai government in the case of liquid bio-fuels for the transportation sector.

The prices of biofuels are kept competitive with the liquid fuels derived from fossil fuels by adopting the principle that the latter should be responsible for the long-term sustainability of the former (the polluter payer principle). If a similar approach is adopted by drawing an analogy with the liquid biofuel policy of the Thai government, then the liquid fossil-fuel used in industries and power plants could be priced such that it takes care of maintaining the bio-fuel cost competitive with fossil fuel for all times to come. Since the quantum of bio-fuel to substitute liquid fossil fuel is not substantial, the amount of cross-subsidy needed may not be high but it will ensure that a fair price is guaranteed for all the partners involved in the supply side, including those who provide feedstock for bio-fuel production.

f) GEF (PPG)-130075 Preparatory Assistance – Greening economy through low carbon SMEs development in Thailand

Background

A Project Preparatory Grant was received by GEF to promote investments in renewable energy technologies (RETs) for heat generation in manufacturing SMEs for reduction of carbon footprint (CFP) of their products in Thailand.

The Thai Government introduced the “Green Industry Initiative” (GII) in 2011, which aims at the sustainable growth of industrial sector in accordance with ecology and social well-being. Green Industry Promotion and Development Office (GIPO) under MOI is directly responsible for this initiative. It encourages the manufacturing enterprises in continuously improving their production process and environmental management. MOI aims to get 70,000 enterprises certified as Green Industry by 2018 while there were around 2,675 certified organizations under the GII program as of January 2013.

Abundant RE potential exists in Thailand, which can be used to replace fossil fuel usage for heat generation in the SME sector. However, SMEs perceive the investment in a new technology and required employee training programs as risky. Even if the RETs offer an alternative cheaper choice of fuel to Liquefied Petroleum Gas (LPG)/coal products, they are reluctant to invest, mainly due to lack of confidence. The key barriers to the implementation of RETs for heat generation include:

- a. Inadequate data on baseline GHG emission in SMEs to plan for mitigation activities;
- b. Lack of awareness and technical know-how among SMEs in RETs potential for heat generation;
- c. Lack of framework to develop policy and incentives to reduce GHG emission from SMEs;
- d. Lack of interest among SMEs to gain access to the available funds due to lack of trust in RETs;
- e. Inadequate technical capacity among key decision makers in public & private sector, technical institutions, banks/financial institutions, engineering companies, etc.; and
- f. Limited experience in RETs for heat generation.

The main expected project outcomes were as follows:

- Creation of a conducive environment for carbon footprint (CFP) reduction in SMEs through the development of policy measures and streamlining of incentive schemes;
- Development of human and institutional capacity for heat generation from RETs and CFP labelling for products; and
- Support higher investment in RETs for heat generation in SMEs.

The Office of Small and Medium Enterprises Promotion (OSMEP) under the Ministry of Industry was identified as the main counterpart for the project. It was also envisaged to involve a not-for-profit organization, the Foundation of Institute for Small and Medium Enterprises Development (ISMED), as the other executive partner.

The change in the national government led to many changes at the ministerial as well as departmental level. Before UNIDO could make adequate progress to develop the project document for submission to the GEF Council, OSMEP expressed its inability to serve as the main counterpart of the project. Hence the project has been shelved though its objectives were very much aligned with the industrial objectives set by the Thai government as outlined in the National Industrial Development Master Plan (2010-2029).

4.4 Regional Environment and Energy projects

a) GF/RAS/10/006 – Regional Project: Regional plan for the introduction of BAT/BEP strategies to industrial source categories of Stockholm Convention Annex C of Article 5 in ESEA region

Background

The East and South East Asia (ESEA) Forum was established by UNIDO for developing and formulating a regional action plan on “Best available techniques (BAT) and Best Environmental Practices (BEP)” addressing the obligations of the member countries in relation to the Article 5 of the Stockholm Convention on Persistent Organic Pollutants (POPs). This medium-sized project supported by GEF was formulated as the outcome of the regional action plan.

Most countries had no specific laws for POPs, especially Unintentionally Produced POPs (UP-POPs). Most of the participating countries had just some environmental quality standards. There were no specific laws dealing with POPs and UP POPs, in particular dioxins/furans in the air or from stack sources. Moreover, there was a need for regulations on environmental quality standards, product standards, emission standards and technology/process standards, together with investments for new technologies. There was also need for capacity building at different levels, to establish an integrated pollution prevention and control, especially for UP-POPs, to create an enabling environment for monitoring.

This regional project aimed at reducing and, where feasible, eliminating UP-POPs releases, and preparing a detailed plan of action, which would enable ESEA countries to adopt and introduce BAT/BEP strategies and enhance the relevant guidelines on BAT/BEP for priority industrial source categories listed in Part I and II, Annex C of

the Convention. It focused on addressing specific features of industry, common practices in the region and related socio-economic considerations.

The immediate objective of the project was to establish inventories for each type of source category and UP-POPs baseline inventories, achieved by specifically designed sector studies and targeted capacity building. In addition there were efforts to reinforce the significant linkages among the concepts of energy efficiency, reduction of UP-POPs and other industrial emissions, addressing the requirements of the Stockholm Convention (SC) and of the Climate Change Convention. During the monitoring campaigns in the selected facilities, not only UP-POPs releases were targeted, but also process parameters giving information on the performance of the plant, thus allowing a proper implementation of BAT/BEP measures.

The four priority industrial source categories addressed were: 1) Fossil fuel-fired utilities and industrial boilers, 2) metallurgical industry, 3) open burning and 4) waste incineration.

The MSP project was approved by GEF in June 2010 and the implementation started in August 2010 through the financing of a GEF grant of US\$ 950.000 and a co-financing of US\$ 2,180,760 received in cash and kind from participating countries as well as the Swedish Environmental Protection Agency. Originally the project was expected to be completed in two years but it was extended until March 2013 to organize the final Steering Committee Meeting in December 2012 and share the main results of the project in a final project workshop in Nha Trang (Vietnam) with the participation of all the National Coordinators and some Government technical staff of the participating member countries.

The terminal evaluation of the project was carried out in January 2014. The findings presented in this report are mainly based on the conclusions of the terminal evaluation report and assessment by the country evaluation team of the follow-up of recommendations in Thailand.

Relevance

The project's activities were aligned with local needs and priorities as well as the needs of the region (establishment of a regional coordination platform). The project design was relevant to the GEF strategies. It was formulated under the GEF 4 focal area strategy and specifically Strategic Program 1: strengthening capacities with the objective to build the capacities required in the eligible countries to implement in a sustainable manner the action plans as reflected in their National Implementation Plans to meet their obligations to the SC.

The project addressed the countries' obligations regarding the Stockholm Convention. It also assisted in the implementation of BAT/BEP related action plans of the participating countries as reflected in their respective National Implementation Plans (NIPs). The Article 5 of the SC states that each party shall develop an action plan or, where appropriate, a regional action plan to reduce the total releases of chemicals listed in Annex C, with the goal of their continuous minimization and, where feasible, ultimate elimination.

UNIDO acted as the implementing agency of the project. UNIDO is specialized in the implementation of the BAT/BEP guidelines and guidance. It has gained experience and learnt lessons through UNIDO National Cleaner Production Centres (NCPCs), Investment and Technology Promotion Offices, Field Offices and Environment Technology Centres, as well as others, to make it easier to understand and use by the industrial sector of the region.

Project design and ownership

The project design was based on the preliminary survey conducted to compile source-specific UP-POPs release and the identification of the key barriers to the adoption of BAT/BEP in the ESEA region. The factors hampering the adoption of BAT/BEP included lack of national policies and legal framework, limited technical experience and capacity, lack of monitoring capabilities, lack of knowledge on the associated health and environmental impacts, investment requirements for the adoption of BAT/BEP in industries, etc.

The project was designed to address the above barriers by undertaking the following activities:

- Comprehensive survey of the selected industrial sectors to fully analyse and adopt measures that will support compliance efforts;
- Proper auditing of UP-POPs releases through actual sample site monitoring, sampling and analysis;
- Establishment of legal, management and policy structure for the region-wide implementation of the foreseen activities;
- Enrichment and strengthening of technical capacity in the region through in-plant assessment of selected sectors and sampling and monitoring of UP-POPs emissions;
- Publishing of regional guidelines and guidance on priority source categories of Annex C to facilitate the adoption of management, operational and purchasing practices;
- Widespread dissemination of cleaner production methods through targeted seminars/training courses; and

- Development of common methodology to calculate Polychlorinated dibenzodioxins (PCDD) / Dibenzofurans (PCDF) releases to facilitate regular updating of the inventory of UP-POPs releases.

The project document addressed the cost effectiveness issue by introducing the plan of establishing costs to UP-POPs reduction on regional partnership basis such that the sectors in the participating countries would cooperate and share technical experiences by enacting similar policies of industrial CP, energy efficiency, reduction in the use of toxic chemicals and other resources. Institutional coordination and supporting mechanism were outlined for each of the seven participating countries, thus engaging the involvement of the appropriate counterparts in project implementation.

In Thailand, the following key institutional stakeholders were retained for playing active role in the project:

- The Ministry of Natural Resources and Environment (MNRE) and its Pollution Control Department;
- The Ministry of Industry and its Department of Industrial Works, and the Industrial Estate Authority of Thailand;
- The Ministry of Energy and its Energy Policy and Planning Office (EPPO);
- Others such as the Ministry of Interior (MOI), Ministry of Commerce (MOC) and its Customs Department, and the Ministry of Public Health (MOPH).

As far as project implementation is concerned, the project document proposed a novel regional approach with the project management structure at the regional level that was widely accepted by the participating countries. The oversight would be provided by ESEA BAT/BEP Forum Board to ensure that high-level attention was given to policy and legal objectives of the project. The monitoring and evaluation (M&E) framework was incorporated in the project document for implementation according to GEF M&E procedure.

Efficiency

In the framework of the project, training courses and programs were held on new technologies and processes.

Long-term actions such as Cleaner Production methodology guidelines were applied. Analytical measurements made in selected facilities of the participating countries allowed to develop emissions inventory.

Training courses were also held for laboratory personnel on sampling methods of UP-POPs, sample preparation and analysis. The project also contributed to the establishment of certified monitoring laboratories.

Training courses were organized for analytical needs and for certification of applied analytical methods as well as certification of technical laboratory personnel, including those involved in hazardous operations.

Based on the ratings of the answers to the questionnaires distributed, interviews and assessment reports, the terminal evaluation assessed the training to have been conducted efficiently and satisfactorily with the funds at the disposal of the project.

Effectiveness

The annual reports of the project show that the project was on track with respect to the work plan. The regional coordination platform was established and strengthened further through the activities carried out at the regional level.

The project achieved the set objectives in a satisfactory manner by creating a platform for information exchange and facilitating technical discussions. It contributed to building capacity in the area of BAT and BEP, particularly in the targeted priority sectors. The participating countries introduced UP-POPs standards in some priority sectors. Workshops were held for raising awareness and disseminating information on UP-POPs and BAT&BEP.

Considering the fact that dioxin sampling and analysis require resources, training and capacity building, partnerships with specialized international laboratories was established for dioxin analysis.

However, though gaps on the legislations were assessed, their enforcement was not possible during the project period due to the scarce resources available for the project.

Sustainability

The terminal evaluation rated the overall implementation of the project as satisfactory with some marginal shortcomings.

The project was instrumental in establishing Project Coordination Units in each participating country and appointing National Coordinators. The participating countries translated into their national languages the guidelines prepared by the Stockholm Convention Secretariat for undertaking awareness raising campaigns. Workshops were organized with the leadership of Swedish EPA for disseminating information on UP-POPs and on policy frameworks in BAT/BEP.

While the main objective was satisfactorily achieved, specific activities such as the sampling and monitoring of UP-POPs releases in the metallurgical and waste incinerator sectors could not be completed as the cost of each assessment in industries was estimated to be too high to fit into the limited funds available for project execution.

Considering the timeframe of 3 years for project implementation and the absence of adequate funding to cover the 7 countries of the ESEA region, it is difficult to foresee and assess the future sustainability of the project.

The country evaluation team had a discussion with the Pollution Control Department (PCD) under the MNRE of Thailand to assess the sustainability of the project outcomes. Though PCD played an important role during the project designing phase, its involvement and participation was limited during the project execution because the main consultant hired by UNIDO to implement the project activities came from an academic institution and the activities were carried out mostly using the project budget complimented by contribution from the academic institution. As a result, there was low level of interaction between PCD and the country project manager. PCD budget allocated for similar activities were cut during that period. The sustainability of the project's outcomes could have been better ensured if PCD could have demonstrated the ownership by actively engaging in the project and synergizing the efforts.

This point was also highlighted in the recommendations of the terminal evaluation. It noted that while sufficient budget was available for the management of the project, the government counterparts did not contribute to the budget as expected and in proportion to the needs.

Impact

The most important impact of the project has been the strengthening of policies in several countries. Mongolia, Lao PDR and Cambodia have drafted their Boiler Act. China has issued "Guidelines on Best Available Technologies for Pollution Prevention and Control for Medical Waste Treatment and Disposal". As a pre-requisite to start the BAT/BEP project, Mongolia amended the BAT/BEP requirements into the "Law on Impact Assessment of Mongolia". Thailand has issued dioxin standards for priority source categories including metallurgical, waste incinerator and crematoria.

Some of the other positive impacts of the project are listed below:

- The regional coordination mechanism led to the sharing of experience and provision of technical support and expertise among the participating countries;

- Private sector has made investment for the adoption of BAT/BEP in their facilities;
- Capacity was built in dioxin sampling and analysis; as an effective result of regional coordination, China and Vietnam took the lead in implementing the training on dioxin;
- Training of technicians of relevant sectors created awareness on process improvement and emission reduction through the introduction of BAT/BEP measures; and
- Baseline studies on local and traditional practices were produced.

b) GF/RAS/10/003/A03, XP/RAS/11/002, GF/RAS/09/001 – Regional Project: Demonstration of BAT and BEP in fossil-fired utility and industrial boilers in response to Stockholm Convention of POPs

Background

UNIDO has adopted a programmatic approach for supporting the establishment of global, regional and sub-regional BAT/BEP forums and relevant projects. Based on the experience gained through promotion and dissemination of environmentally sound industrial technologies, UNIDO decided to expand its POPs programme and offer technical cooperation to developing countries and countries with economies in transition to fully enable the implementation of BAT/BEP related provisions of the Stockholm Convention.

The national implementing partners of the six participating countries identified the fossil fuel-fired utilities and industrial boilers as the priority sources for the introduction of BAT/BEP. Hence the objective of the project was to establish the basis for introducing BAT/BEP in the industrial source category of fossil fuel-fired power utilities and industrial boilers that have the potential for comparatively high formation and release of PCDDs/PCDFs and PCBs to the environment.

Several barriers were found to hamper the adoption of BAT/BEP measures in the fossil fuel fired power utilities and boilers of the participating countries. These include:

- Lack of national policies and legal framework;
- Limited technical experience and capacity;
- Lack of monitoring capabilities;
- Lack of knowledge on the associated health and environmental impacts of UP-POPs emissions; and
- Huge investment requirements.

To address these barriers, the strategies proposed by the project include the promotion of efficient operation of combustion technologies, cleaner production processes and monitoring activities supported by the necessary capacity building and regulatory framework consistent with BAT/BEP guidelines and guidance. The project also aims at creating regional capacity in monitoring or UP-POPs releases, by enhancing regional R&D capabilities and institutional framework and promoting regional education options in the area of POPs. The knowledge gained through the project would improve the local and regional skills in operating boilers and regulating the operational parameters based on better understanding of the operations and sharing and transfer of skills to the operators.

The FSP project was approved by GEF in April 2010 and the implementation started in May 2010 through the financing of a GEF grant of US\$ 4 million and a co-financing of US\$ 9.1 million received in cash and kind from participating countries as well as UNIDO. The project was originally expected to be completed in 4 years but it was extended by 2 more years.

The mid-term review of the FSP was completed in February 2013. The findings presented in this report are mainly based on the conclusions of the mid-term review report and assessment by the country evaluation team of the follow-up of recommendations in Thailand.

Relevance

The project concept is in line with countries' sectoral and development priorities, and the project outcomes will contribute to the national development and plans in both the sectors of energy and environmental protection.

The overall project objective, its expected output and outcomes can be considered very relevant either from the point of view of the SC requirements, or with reference with the GEF POPs focal area objectives. The project has been approved under GEF-4, however project outputs are also relevant to the objectives subsequently set by GEF 5 on POPs focal area.

Hence the project activities aimed at enhancing capacities in the project countries, at supporting and strengthening the legislative and regulatory framework and the administrative capacity, and at demonstrating technologies, are fully relevant to the GEF-4 POP focal area strategies, whereas the components of the project envisaging the implementation of BAT/BEP are also relevant to the GEF-5 POP focal area objectives and priorities.

Project design and ownership

The project should be considered mainly as a capacity building project, as the key outputs are training, upgrading of the existing legislation to include SC requirements, drafting and implementation of guidelines and guidance, and the establishment of a UP-POPs baseline inventory. The project implementation, however, also envisages technology transfer – like the substitution of obsolete boilers with new, efficient boilers, and sampling and analysis of exhaust gas from the stack of industrial plants before and after the implementation of BAT/BEP.

The project objectives do not include any measurable target of UP-POPs reduction. However, under output 3, the approximate reduction of 0.31 g TEQ (Toxic Equivalent Quality)/year from pilot cases and fuel savings of USD 1.3 m/year is established as Objectively Verifiable Indicator for the activity 3.3.4. Given the high uncertainty associated with the analytical determination of very low concentration levels of dioxin in flue gas emitted from boilers, the direct measurement of this objective may also be affected by a significant uncertainty.

The mid-term review found low participation of national institutions during project design stage. As the interaction with counterpart institutions in the project design was quite limited, some of the project managers considered that the capacities of the executing institutions and their counterparts were not taken into account. The involvement of target beneficiaries in the project formulation was low. While the involvement of national counterparts was fair, the opportunity for exchanges in the course of project design was not adequate.

Moreover, lessons from other relevant project were not fully incorporated, with particular reference to the difficulty to demonstrate effectiveness of BAT/BEP by means of a limited number of sampling and analyses in countries where the analytical capacity is limited, which was already experienced in similar, though smaller, projects, like for instance the UNIDO bilateral project on BAT/BEP demonstration implemented in China and co-financed by China and Italy.

UNIDO HQ and the international consultants have been the main driving force for activities related to adopting guidelines/guidance on BAT/BEP. A greater involvement of national project managers, experts and institutions is necessary for achieving more sustainable results. Similarly, international experts on mission carried out most of the training activities. There is the need for a higher country ownership and of a better systematization of training materials to ensure the sustainability and replicability after project ends.

The current country evaluation had the opportunity to meet the National Project Manager (NPM) as well as the National Project Coordinator (NPC). Based on the

responses received, the interaction between the NPM and NPC was noted to be sub-optimal. The level of institutional engagement was found to be low while NPM was taking the lead in implementing most of the project activities with support from UNIDO HQ and the international consultants. A higher country ownership is essential for the sustainability of the project initiatives.

Efficiency

On the whole, the project is based on an efficient approach that would ensure selection of cost/effective option. The centralized execution by UNIDO HQ ensures that the activities are efficient in term of cost/value ratio. The activities related to the simultaneous implementation of measures aimed at reducing GHG emission, increasing plant efficiency, and reducing UP-POP emission are intrinsically efficient. However, the slow implementation of some activities has also an impact on their cost, therefore reducing their efficiency.

The mid-term review has suggested a moderate rearrangement of component intended outcomes and activities to ensure further improved project efficiency. More uniform management and supervision approach is needed at the country level to ensure consistent outputs.

Effectiveness

The mid-term review had noted the delays experienced by the project due to various reasons: difficulties in achieving agreements with industrial partners; biddings difficulties; issues on the shipment of samples and custom clearances; slow start of training activities, with special reference to the establishment of training curricula; slow involvement of institutional stakeholders in reviewing relevant legislation and proposing amendments. It was also observed that though none of these delays was so severe as to endanger project results, it was however necessary to draft a credible and practicable planning within the deadline and get the agreement of all the project partners. Considering the delays in the completion of some critical project activities (instalment and testing of new boilers, second round of sampling and analysis, training, improvement of legislation), the need for some extension in the project duration was expressed during the mid-term review.

The country evaluation team visited one of the two pilot sites in Thailand and discussed with the industrial partner. While desk studies conducted by the project have claimed considerable energy savings with the adoption of BAT/BEP in Thai pilot facilities, the status of the experimental unit and the level of instrumentation were found to be inadequate at the time of the visit to quantify precisely the savings claimed by the target industry from the use of waste alcohol as an effective substitute to the traditional fuel. In the absence of on-site measurements and analysis, it would

be difficult to make realistic cost-benefit assessments of the modifications adopted by the plant.

Sustainability

Most of the participating countries have strong and long-term support from government for achieving the project objectives, but the evaluation team did not find a strong level of support from the Thai counterpart agency. In most of the countries, legislation and guidance on boilers including BAT/BEP is being adopted. Moreover, the project is ecologically sustainable as it promotes the use of more efficient boilers, resulting in lower GHG and UP-POPs emission.

With few exceptions, the incentive mechanisms and PPP management scheme are yet to be established. In spite of the fact that more efficient new boilers can result in savings of fuel consumption, most of the small industries still cannot afford the investment on new more efficient boilers. Hence there is a need to establish sustainability mechanisms such as incentives, training, etc.

Thanks to the contribution of international experts, the project has been establishing an excellent training scheme on boiler operation as well as on sampling and analysis of UP-POPs. For the sustainability of the project initiatives, it is important to hand over the training activities from international experts to national institutions before the project ends. It is most important that all participating countries introduce legislation favouring the use of BAT/BEP compliant boilers.

4.5 Assessment of the role of UNIDO Regional Office

UNIDO Regional Office in Thailand is one among the three regional offices of UNIDO in Asia, covering Cambodia, Lao People's Democratic Republic, Malaysia, Myanmar and Thailand. Ever since the opening of the Regional Office in 2000, UNIDO has established strong relationship with key institutional partners. Thai government partners recognize the positive contribution of UNIDO RO as well as its staff. UNIDO's technical assistance is considered to be relevant and valued by the project beneficiaries.

Bangkok has a very high concentration of United Nations regional offices; there are more than twenty-eight United Nations regional offices in Bangkok. These United Nations agencies work together and collaborate on projects with the Thai Government, businesses and other Asian countries. Members of the UNCT for Thailand appreciate the proactive stance of UNIDO RO and the role it has been playing as an active member of the UNCT in spite of the fact that UNIDO RO has very limited staff and resources. In fact only one national programme officer for Thailand also contributes to UNIDO's activities in other neighbouring countries as well. UNIDO

RO has been heavily engaged in common country assessment exercise that is linked with the formulation of the next UNPAF 2017-2021 which will be oriented towards supporting the government in achieving SDGs and creating a more inclusive society.

UNIDO RO is also well appreciated by the UNIDO HQ staff for the assistance extended during the different phases of project development, especially as the UNIDO HQ staff are far away, have to develop and execute projects in different countries and continents, and have limited opportunities to be present at the points of project execution. Support to UNIDO HQ staff is mainly in the form of recommending suitable counterpart agencies and establishing preliminary contacts, facilitating the designing of the project document, supporting and troubleshooting during the project execution.

Many stakeholders, mainly institutional beneficiaries, involved in projects initiated by UNIDO with support from GEF and other donors find their interaction with UNIDO RO as well as the UNIDO HQ staff a little confusing as they fail to see clearly the manner in which GEF projects are executed. The roles and responsibilities of UNIDO RO vis-à-vis UNIDO HQ staff is not very clear to them. For example, regarding the technical aspects of the project, national counterparts and beneficiaries interact with national coordinators hired from project funds, either based in UNIDO RO or in their offices whereas for all financial matters, the national coordinators have to refer to project managers based in UNIDO HQ who are officially in-charge of developing and executing the project. At the country level, there is very little autonomy to handle the project financial aspects, as a result of which national coordinators engaged in running the day-to-day aspects of the project may not be in a good position to ensure project delivery efficiency, in terms of financial resources mobilized against the project outputs delivered.

It was noted that UNIDO RO has been very willing to assist the UN HQ staff to resolve some issues when some problem arose in project execution, especially by engaging dialogue with the national counterparts and/or key beneficiaries. On the other hand, the sharing of information regarding the progress of the project has often seemed to be sub-optimal in the sense that the progress reports are not systematically shared and UNIDO RO is not always involved as one of the members of the project steering committees. While it is true that UNIDO RO is already overburdened with many tasks and these tasks could appear as additional loads, keeping the UNIDO RO informed and involved can only be considered beneficial for the project outputs and outcomes.

Based on the assessment of the UNIDO RO role and the feedback received from various stakeholders, the evaluation team finds that it is important to not only maintain the RO in Bangkok but also strengthen it further by exploring ways to allocate additional resources that can strengthen the interaction between UNIDO RO and UNIDO HQ staff for ensuring greater success in project delivery within the sub region.

Partnership and coordination

Bangkok being the regional UN hub, UNIDO's presence in Bangkok is important in order to make its presence felt and to actively participate in UN's national as well as regional initiatives. As mentioned earlier, UNIDO plays a very pro-active role in UNCT and its various initiatives, including the drafting of UNPAF.

Following the agreement signed between UNIDO and the Thai government, the Ministry of Industry of Thailand is UNIDO's privileged partner. Hence there is close cooperation between UNIDO and the Ministry of Industry, the latter providing generous office space in the heart of the city in addition to an official vehicle with driver. The Ministry of Industry also sends an official on deputation to UNIDO but it is often difficult for the Thai staff to be well integrated into the UNIDO RO team because the limited knowledge in English which is UNIDO's official language of communication. This acts as a handicap in the sense that the Thai staff finds it challenging to develop the full capacity and skill to function and participate effectively in UNIDO RO's day-to-day activities.

As more and more projects developed by UNIDO in Thailand are related to energy and environment issues, it is important to evolve a mechanism that allows the different Thai agencies to be consulted instead of limiting the Ministry of Industry as the sole entry point of contact with Thailand. This is discussed further and some suggestions are included in the recommendations.

UNIDO RO plays an effective role in providing programmatic and administrative support to the two UNIDO Desks in Cambodia and Lao PDR. However, as far as the project development and implementation aspects are concerned in these two countries, the UNIDO Desks are quite autonomous and work in tandem with the project managers based at UNIDO HQ.

5. Conclusions

5.1 Poverty reduction through productive activities

The programme developed as a part of UNPAF was designed to support the Thai government's "MDGplus" initiative, aiming to achieve the MDG goals sooner and better by focusing attention on less developed provinces. It set a good example of the concerted efforts among UN agencies to design and implement a programme emphasizing on building a more equitable society by empowering the most vulnerable people. Through capacity building and targeted skills development, the programme demonstrated ways to enhance productivity, diversify the economic base and promote small-scale business enterprise development.

The programme introduced clear conceptual design and practical approaches that have proven to be relevant and useful for the target groups and communities. Emphasis was also given on building the capacity of people in responsible position so that they would be able to replicate the initiatives and widen the base to benefit more vulnerable communities in less developed provinces.

The programme required a wide range of technical innovations in remote areas, involving many stakeholders from UN agencies, provincial government offices and the national implementing partners. Thanks to an effective PMU under the coordination of the international programme manager, the programme was executed efficiently, delivering the planned outputs and securing participation of all key target groups and communities.

On the other side, the programme's effectiveness in achieving the outcome could not be ascertained due to the lack of pertinent data such as quantification of productivity improvements, increase in income, improved nutritional and health status of the target groups, and capacity for environmental preservation. It can be partially attributed to the relatively small budget and short time period to implement the programme. The programme also faced another drawback when the province failed to play an active role in coordinating, planning and reporting after the transfer of programme responsibility following the departure of programme manager.

The terminal evaluation had cautioned that many target groups and communities would require some form of external support to continue building their institutional, financial and management capacities. It had also expressed the need for continued policy level support of the provincial government along with some form of external assistance, both financial and technical. It was recommended to formulate programme of consolidation during 2014/15 with the assistance of the UN agencies. Though FAO has conducted a follow-up mission in May 2015 to assess the various initiatives, no concrete action has been contemplated so far.

Further consolidated effort in the form of a follow-up UNJP is desirable to strengthen the institutional, technical and financial capacity of the local stakeholders in order to ensure replication and sustainability of the overall programme.

As far as UNIDO intervention is concerned, training provided in the programme was well designed and delivered to strengthen the capacities of institutions and communities associated with the programme. The local government is continuing to support some of the programmes, mainly through financial assistance for purchasing of equipment but that is not enough to strengthen their capacities to expand their livelihood activities and scale up the pilot initiatives.

5.2 Trade Capacity Building

Upgrading the technical and personnel capacity of the chemical-testing laboratories

Five years after the completion of the UNIDO supported project, the three laboratories that were assisted to upgrade their technical and personnel capacities, are in a better position to provide support to industries that are engaged in exporting products to the EU. The targeted laboratories confirm having gained knowledge, tools and expertise that have helped them expand the scope of services delivered to their clients. Though the project had to be terminated before meeting fully the needs of the industry, the targeted laboratories show a high degree of satisfaction from the project.

On the other side, while the laboratories confirmed generating revenue from the use of upgraded laboratory equipment and trained laboratory staff, none of them had made any effort to quantify their contribution in the form of increased trade with the EU.

Some beneficiaries lamented the absence of further interaction with UNIDO after the completion of the project, particularly in matters pertaining to further developments in relation to REACH regulation. They perceived UNIDO as a “donor” than an agency with technical expertise/competence.

Trade capacity building in Thailand through strengthening the capacities of testing laboratories for food and agricultural products

Changes in the political scenario resulted in budgetary constraints for the targeted institute (NFI) and time delays in project execution. In spite of these constraints, NFI’s effective cooperation, strong sense of ownership and active involvement were key to the delivery of visible and positive outputs. The planned output that was not fully delivered due to budgetary constraints has not affected the capacity of NFI to perform the expected duties.

NFI appreciates the support received from UNIDO and the benefits gained through the project: mainly the training received by the staff in Thailand as well as selected

laboratories in Europe. The support received from the project has inspired NFI to further develop and maintain excellent laboratory facilities.

In spite of several changes in the senior management, NFI continues to sustain the activities initiated with support from UNIDO and is keen to deepen the relationship with UNIDO by serving as trainer for UNIDO projects in the neighbouring LDCs, thus contributing positively to strengthen the regional supply-chain network and enhance the dynamic economic development in the Mekong region.

5.3 Environment and Energy

Industrial energy efficiency in Thailand

The overall project design is relevant to Thailand's energy priorities. The logical framework is well developed, and the M&E process is well outlined as well as the reporting requirements. One of the drawbacks of the project design is the non-consideration of certain aspects such as institutionalization of the peer-to-peer network and training initiatives to ensure their smooth functioning beyond the project life.

The project is on track for completion on time though after experiencing some initial delays, the project execution time frame was extended by a year. The progress made by the project is highly satisfactory and the outputs, both quantitative and qualitative, are appreciable. There is a strong engagement of the main partner and the project management team is playing a very proactive and effective role.

Due to limited inter-ministerial cooperation and parallel initiatives, potential synergies between the Ministry of Industry and the Ministry of Energy have not been fully tapped. Also, there is a mismatch between the focus of the project and the key interest of the main partner. More innovative approach needs to be contemplated to reconcile the differences and address the challenges faced by the SMEs.

South-South technology transfer: the pilot case of ethanol production from cassava

The project is relevant to the national development and environmental priorities of the concerned countries. However, the project design was adjudged to be weak and there was limited consultative process during project development. The PRF and target indicators were not developed well enough to address the key barriers and the associated risks. The project witnessed difficulties and delays because the key project partner declined to participate after the project received GEF approval. The academic institution that volunteered to assist in project implementation plays a dual role of project partner and the key consultant, giving rise to conflicts of interest.

At the time of MTR, the project had not achieved any of the planned outputs. One of the main causes of the delay and inadequate project performance is the poor quality of work plan and inadequate M&E during the project execution though it was well

designed. No adaptive management strategy had been applied to cope with delays in project timeline and delivery of outputs.

Some deficits were observed in UNIDO supervision and backstopping. Following the recommendation of the MTR, a full-time project manager has been appointed to improve project management and adopt a more effective mechanism for creating synergy among the key actors, putting in place a monitoring system that would keep track of the progress made in the project, and establishing a PSC with improved structure.

Promoting small biomass power plants in rural Thailand

The project is of high relevance to the government as it aims at introducing suitable policy that favours community based biomass power plants through a pilot initiative. Some difficulties were encountered while going ahead with the pilot activities. One of the reasons is the limited consultative process during project design, resulting in the exclusion of the key stakeholders in the project. The project also faced some time delays because of the re-organization of the Ministry of Energy due to changes in the central government.

The Ministry of Energy as the key institutional partner recognized the barriers it has to deal with. It is highly committed and is actively involved in overcoming the bottlenecks faced by the project. The project's impact will depend largely on the capacity of the project partner to bring on board the key stakeholders who can be instrumental in overcoming some of the barriers hindering the project's progress. Though it is possible that the project may not achieve the expected outputs within the remaining project execution time, efforts are on to create a suitable policy environment for sustaining the project initiatives.

Promoting the demonstration, deployment and transfer of innovative low-carbon technologies

The project initiative is in full agreement with Thailand's industrial development master plan, and would help to strengthen policy and regulatory framework for scaling up and accelerating cleantech competition and innovation across Thailand.

The project has yet to take off apart from the first PSC meeting held in February 2015 because of the delays in getting approval from the Cabinet of Thai government for projects supported by international organizations. The project's sustainability and impact will depend largely on the dynamism of the main partner in getting government approval and greater involvement of the key stakeholders through a consultation process.

In the absence of any concrete activities to achieve the targeted outputs, it is too early for the current evaluation to give any verdict on the project's efficiency, effectiveness, impacts, etc.

Reduction of GHG emissions from Thai industries through promoting investment in the production of usage of solid bio-fuels

The project does not display a strong ownership of the Ministry of Industry, which has shown great hesitation to lead the project due to the low prevailing fossil fuel price in the country. UNIDO has been very proactive in providing timely support for the smooth progress in the development of the project document. The outputs so far have been quite impressive, both quantitatively and qualitatively. There is a general feeling that UNIDO is occupying the driver's seat as a result of which the national counterparts tend to depend heavily on the initiatives taken by UNIDO.

Since there have been prior experiences of setting up demonstration plants for pellet utilization in small boilers, the focus of the project should be more on the long-term objective of the Thai government to lower the dependence on imported fossil fuels and the emissions of GHGs instead of focusing too much on the commissioning of the pilot project. The project needs to target developing policy that ensures the competitiveness of the biofuel at all times as it has been so well demonstrated by the Thai government in the case of liquid bio-fuels for the transportation sector.

Due to the internal hesitation of MOI about whether or not to take up the project, the deadline for project document submission to GEF Council (November 2015) could not however be met.

Greening economy through low carbon SMEs development in Thailand

The objective of the project proposal is very much aligned with the industrial objectives set by the Thai government as outlined in the National Industrial Development Master Plan (2010-2029). So it is a big disappointment for UNIDO that the project has been shelved because OSMEP, the key institutional partner, has expressed its inability to take part in the project following the changes at the ministerial and departmental level, as a result of changes in the national government.

5.4 Regional activities on environment and energy

Regional plan for the introduction of BAT/BEP strategies to industrial source categories of Stockholm Convention Annex C of Article 5 in ESEA region

The overall implementation of the project has been satisfactory with some marginal shortcomings. It has contributed to building capacity in the area of BAT and BEP, creating platform for information exchange and facilitating technical discussions. The project is relevant in the context of Thailand though the level of institutional involvement could have been stronger in the project.

Though gaps on the legislations have been assessed, their enforcement has not been possible during the project period due to the scarce resources available for the project. While sufficient budget was available for the management of the project, the

government counterparts did not contribute to the budget as expected and in proportion to the need.

The most important impact of the project has been the strengthening of policies in several countries. The regional coordination mechanism has led to the sharing of experiences and provision of technical support and expertise among the participating countries.

Demonstration of BAT and BEP in fossil fuel-fired utilities and boilers to reduce POPs

The participation of national institutions and target beneficiaries was low during project design stage. Moreover, the lessons from other relevant projects were not fully incorporated, with particular reference to the difficulty to demonstrate effectiveness of BAT/BEP by means of a limited number of sampling and analyses in countries where the analytical capacity is limited.

UNIDO HQ and the international consultants have been the main driving force for activities related to adopting guidelines/guidance on BAT/BEP. The centralized execution by UNIDO HQ ensures that the activities are efficient in terms of cost/value ratio. More active involvement of national project managers, experts and institutions is necessary for achieving more sustainable results.

In Thailand, the interaction between NPM and NPC was noted to be sub-optimal. The level of institutional engagement was found to be low while NPM was taking lead in implementing most of the project activities with support from UNIDO HQ and international consultants. While desk studies of the project claim considerable energy savings with the adoption of BAT/BEP in Thai pilot facilities, in the absence of on-site measurements and analysis, it would be difficult to make realistic cost-benefit assessments of the modifications adopted by the plants.

In spite of the fact that more efficient new boilers can ensure savings in fuel consumption, most of the small industries still cannot afford the investments on new more efficient boilers. Hence there is a need to establish sustainability mechanisms such as incentives, training, etc.

5.5 Overall conclusions

As an upper Middle Income Country (MIC), Thailand is considered to be a country which has already achieved considerable expertise and experience through the implementation of a great number of pilot initiatives supported by bilateral and multilateral development agencies, and more recently by mobilizing its own resources. Hence the country is now less attractive to traditional donors who would like to channel their limited resources to LDCs in the region.

The only UNIDO portfolio that has increased in the last few years are the projects supported by GEF which are likely to witness further rise in the future. On the other hand, it is becoming increasingly difficult for UNIDO to mobilize support for projects that foster poverty reduction through productive activities as well as trade capacity

building. UNIDO therefore needs to think “out of the box” to stay relevant in Thailand. The areas where UNIDO can add value to its activities may include focus on more policy support and advice than undertaking pilot projects, and mobilizing Thai resources for activities aimed at regional cooperation.

Many projects appear to be too much UNIDO driven, overlooking the fact that the technical, managerial and institutional capacities of Thai counterparts have been developing sufficiently over the years. While the intentions of UNIDO may be good, too much support at the project design stage weakens the ownership of the institutional partners. Another weakness of many projects is the excessive emphasis on making the projects technically sound (activities and outputs oriented) but not giving adequate attention to make them result (outcomes and impact) oriented. As a result, while projects may achieve very good results as planned, they may not necessarily lead to long-term impacts due to inadequate emphasis on policy level changes that can guarantee sustainability.

Other noteworthy aspects that have been found to have adverse impact on project output delivery include unrealistic expectations from overambitious projects with limited budget and time frame, and non-materialization of committed co-funding, compromising the realization of SMART outputs.

6. Recommendations

As can be seen in the country evaluation, UNIDO projects are heavily tilted towards environment and energy issues because of the availability of funding from GEF. A more balanced approach is desirable, including the focus on poverty alleviation and trade capacity building, areas which have received no support for at least the last 5 years. As UNPAF 2017-2021 for Thailand is likely to be oriented towards supporting the government in achieving SDGs and creating a more inclusive society, UNIDO and the Government of Thailand should consider the development of a country programme and prioritizing issues that are of key concerns of the country.

For the projects in environment and energy, it seems there are too many areas being covered with limited resources, thus not sending a proper signal as to which areas are the most important from the Thai perspective. Having fewer projects with a certain level of continuity and with greater access to resources will help to achieve more tangible results and have a greater impact at the country level.

Recommendations related to the role of UNIDO RO

UNIDO RO should develop a country programme for Thailand in partnership with government stakeholders by taking into account UNIDO's mandate (ISID, SDG-9) and Thai government's 12th National Development Plan and Priorities (2016-2021).

UNIDO should ensure government ownership and commitment, during project identification/preparation phases, by seeking answers to questions such as:

- Is there a national programme in place to which UNIDO can contribute?
- Is the government leading the process?
- Are all key stakeholders engaged?

Moreover, UNIDO and the Ministry of Industry should set up a high-level coordination mechanism to:

- Develop and provide oversight to UNIDO's country programme;
- Engage relevant representatives from ministries (MOE, MNRE, MOFA, Ministry of Interior, etc.);
- Link project specific outcomes to policy formulation, as needed.

To ensure government ownership and as commitment indicator, UNIDO should formally request the Thai government to appoint for every project one or more officials from the key ministries related to the project to be part of PMU.

Finally, as Thailand has already gained sufficient capacity to develop and execute pilot projects, UNIDO should explore ways to strengthen South-South cooperation in

partnership with Thailand for executing projects in neighbouring LDCs that are serviced by UNIDO RO.

Recommendations related to the project portfolio

1. Poverty reduction through productive activities

When involved in similar joint UN programmes (such as the one in Mae Hong Son province), UNIDO should provide policy level support to provincial government for scaling up and covering greater number of vulnerable population.

2. Trade Capacity Building

a) Upgrading the technical and personnel capacity of the target Thai chemical testing laboratory

UNIDO should consider a new phase of support for the target laboratories to upgrade their skill and knowledge on further evolution of REACH regulation for enhanced trade relations with the EU, and ensure that target laboratories quantify the financial benefits of their activities on enhanced trade with the EU.

b) Trade capacity building in Thailand through strengthening the capacities of testing laboratories for food and agricultural products

UNIDO should consider establishing a partnership with Thailand International Cooperation Agency (TICA) to mobilize the expertise of laboratories under FTI for developing the capacity of personnel and laboratories of the neighbouring countries in order to strengthen the supply-chain network of the Mekong region; thus facilitating south-south cooperation.

3. Environment and Energy

a) Industrial Energy Efficiency in Thailand

The project team should concentrate on evolving innovative mechanisms to address the needs of SMEs prior to the completion of the project, subject to the availability of budget. The project should also seek to create greater synergies between the Ministry of Industry and the Ministry of Energy to avoid duplication of efforts and the adoption of more standard tools and practices.

b) South-South technology transfer: the pilot case of ethanol production from cassava

The project management team should focus on rectifying the flaws identified in the project document: (a) too much importance given to one component of the technology package; (b) attempting to assist the private sector for setting up ethanol production plants prior to evolving the policy and incentive mechanism at the institutional level; and (c) inadequate involvement of the main stakeholders from the beneficiary countries. Learning from the Thai experience, high priority should be accorded to ensuring government buy-in by anchoring activities within the national settings and undertaking vigorous exercise to initiate dialogue with partners from the neighbouring countries so that the project can replicate the key success factors of ethanol promotion in Thailand.

c) Promoting small biomass power plants in rural Thailand for sustaining renewable energy management and community involvement

The Ministry of Energy should bring on board the key stakeholders to remove some of the barriers hindering the project's progress, namely land-use planning issue hampering the sustainable supply of biomass needed for the power plants as well as the issues related to access to the power grid. In parallel, policy changes should be drafted based on the lessons learned in order to promote community-managed small-scale biomass power plants.

d) Promote the demonstration, deployment and transfer of innovative low-carbon technologies

The main project partners should hasten the process of getting government approval so that the project activities can take off without any further delay. In the meantime, a more proactive consultation process is needed to ensure greater involvement of the key stakeholders who have already been active in addressing the issues related to the propagation of low-carbon technologies in Thailand.

e) Reduction of GHG emissions from Thai industries through promoting investment in the production and usage of solid bio-fuels

Learning from the experience of Thailand in promoting liquid bio-fuels in the transportation sector, the project should concentrate more on promoting dialogue among the key institutional stakeholders to explore the option for developing a long-term revenue-neutral policy that favours the growth of biomass use as solid fuel in industry at the cost of the traditional fossil fuels.

7. Lessons learned

Following lessons can be drawn from the present country evaluation:

- A more effective collaboration between the government of Thailand and UNIDO will be more beneficial in developing a “country programme” that identifies the priority areas in which they should work together and then seek funding from potential sources than the choice of the projects being driven by UNIDO on the basis of the financial support the latter is able to mobilize.
- The full commitment and active participation of the main institutional partner(s) at the project design stage, identification of the key stakeholders, and their active engagement are pre-requisites for the successful delivery of project outputs and outcomes.
- Projects that are designed and executed well will most likely deliver the desired outputs but may not be sustainable in the long run unless sufficient care is taken to ensure the continued involvement of the key drivers.
- Non-materialization of the committed co-funding will invariably jeopardize the project’s SMART performance and fall short of the desired outputs and outcomes.
- Projects that have an inadequate project management structure and which lack a rigorous and continuous monitoring mechanism with options to take timely corrective action will most likely miss their major milestones and will fail to deliver the projected outputs and outcomes in a timely and efficient manner.
- Capacity of the main project beneficiaries is best built and sustained when UNIDO plays the role of a catalyst than a reactant.
- Better project performance delivery can be assured if the UNIDO HQ team takes the UNIDO RO into confidence in the programme/project design and implementation.

Annex 1. Summary of outputs and outcomes / comments by evaluation

ID	Project Title	Project no.	Theme	Subtheme	Outputs reported	Outcome reported	Comments
1	UN Joint Programme on Integrated Highland Livelihood Development in Mae Hong Son (Livelihood development)	TF/THA/09/004	Poverty reduction through productive activities	Livelihood development	<ul style="list-style-type: none"> Capacity building (well designed) and targeted skills development of women's groups and other targeted groups for better livelihood activities 	<ul style="list-style-type: none"> Demonstrated ways to enhance productivity, diversify the economic base and promote small-scale business enterprise development, albeit not quantified 	<ul style="list-style-type: none"> No baseline data or targets for productivity improvement, income increase, improved nutritional and health status of target groups Mid and terminal evaluations completed, implementation of recommendations could not be assessed
2	Upgrading of the technical and personnel capacity of the target Thai chemical testing laboratory	XP/THA/08/001; EE/THA/07/002; US/THA/07/001	TCB	Chemical-testing laboratories	<ul style="list-style-type: none"> Six products were identified as important export products to the EU All target laboratories gained knowledge, tools and expertise, and expanded the scope of the services delivered to the industrial customers Laboratories were assisted in building and strengthening capacities 	<ul style="list-style-type: none"> DSS was able to receive the accreditation from Thai Industrial Standards Institute (TISI) and both TISTR and THTI from Thai Laboratory Accreditation Scheme (TLAS) Contribution to a more competitive market for testing services, albeit target laboratories had made no efforts to quantify financial benefits 	<p>Interaction with UNIDO ceased after project completion</p>
3	Trade Capacity Building in Thailand through Strengthening the Capacities of Testing Laboratories for Food and Agricultural Products	TE/THA/10/001; TE/THA/10/002; EE/THA/08/003	TCB	Food and agricultural production	<ul style="list-style-type: none"> Training of staff Upgraded laboratory equipment Obtaining domestic accreditation Participation of NFI to European proficiency testing Proficiency testing 	<ul style="list-style-type: none"> Planned final beneficiaries: Thai entrepreneurs/exporters in food industry, 9,000 food-processing factories with 600,000 employees, benefiting from strengthened NFI capacity to support the food industry 	<ul style="list-style-type: none"> NFI appreciates the support received through UNIDO NFI has continued to mobilize resources and sustain the activities that were initiated with UNIDO support

ID	Project Title	Project no.	Theme	Subtheme	Outputs reported	Outcome reported	Comments
4	Reducing industry's carbon footprint through compliance with an energy management system	GF/THA/11/001; XP/THA/11/002	Environment and Energy	Energy efficiency - management system	<p>conducted by NFI</p> <ul style="list-style-type: none"> • Training activities undertaken to ensure the first 2 outcomes are highly satisfactory, even exceeding the end-of-the-project target • Activities to achieve the Outcome 3 have just begun with surveys and interviews to assess the training needs and look for harmonizing the evaluation criteria to be adopted for extending Energy Efficiency (EE) loans. • Progress in Component 4 has been significant and is rated satisfactory. • Of the end-of-project target of 200 adopted Energy Management System (EnMS) plans, 24 have adopted plans, while 10 more are planned. • Two vendor trainings on systems optimization have been held. 	<ul style="list-style-type: none"> • Increased the awareness and encouraged industrial enterprises to adopt ISO compatible energy management standards that can lead to the realization of continuous energy savings; • Created a cadre of energy efficiency professional within the industrial facilities as well as consultants and suppliers who can be instrumental in initiating a process to transform local markets effectively and to provide industrial system optimization services; • Ensured greater access to financial and institutional support for industrial energy efficiency initiatives; and • Demonstrated energy savings in participating factories through system optimization and increased the adoption of energy management standards by industries. 	<p>Although the project is lagging behind in terms of achieving targets, it should be noted that implementation had to wait until the first training sessions were organized and more results will come in 2015-17 as the National Experts will perform more SO assessments and draft EnMS plans. The project has mainly focused its attention on large industries. There are plans to expand the attention to SMEs if the budget permits.</p>
5	Overcoming policy, market and	GF/THA/12/001/ A01;	Environment and Energy	Technology transfer	<ul style="list-style-type: none"> • Information hub established for 	<ul style="list-style-type: none"> • None of the expected outcomes has been achieved 	<p>The project design was weak and its implementation was</p>

ID	Project Title	Project no.	Theme	Subtheme	Outputs reported	Outcome reported	Comments
	technological barriers to support technological innovation and South-South technology transfer: the pilot case of ethanol production from cassava	XP/THA/12/002; GF/THA/10/006; XP/THA/10/005			disseminating and promoting South-South technology transfer		delayed because the main partner decided to drop out. Based on the feedback received from the MTR, the project has been revamped though it is too early to assess the outputs and outcomes.
6	Promoting small biomass power plants in rural Thailand for sustainable renewable energy management and community involvement	GF-100258; XP-100258; GF/THA/10/004; XP/THA/10/003	Environment and Energy	Renewable energy	<ul style="list-style-type: none"> • Identification of site for the proposed biomass power plant; • Survey of the site and specification of the location of the power plant building; • Design of the power plant building and estimation of the construction cost; • Preliminary estimation of the cost of the power distribution network. 	<ul style="list-style-type: none"> • None of the expected outcomes has been achieved 	Too early to assess the results of the cooperation as the project is facing a number of challenges due to no prior consultation with some of the key stakeholders.
7	Promote the demonstration, deployment, and transfer of innovative low-carbon technologies: The Global Cleantech Innovation Programme for SMEs	GEF-130312	Environment and Energy	Low carbon technologies	<ul style="list-style-type: none"> • Project document is in the course of approval by the Thai Cabinet 	Project document is in the course of approval	Early to assess the project outputs and outcomes as the project activities have yet to start.
8	Reduction of GHG emissions from Thai industries through promoting investment	GEF (PPG)-130319	Environment and Energy	Solid bio-fuels	Project document is in the course of approval	Project document is in the course of approval	Project document is in the course of approval

ID	Project Title	Project no.	Theme	Subtheme	Outputs reported	Outcome reported	Comments
	in the production and usage of solid bio-fuels						
9	Preparatory Assistance – Greening economy through low carbon SMEs development in Thailand	GEF (PPG)-130075	Environment and Energy	Low carbon development	<ul style="list-style-type: none"> Project shelved 		
10	Regional Project: Regional plan for the introduction of BAT/BEP strategies to industrial source categories of Stockholm Convention Annex C of Article 5 in ESEA region	GF/RAS/10/006	Environment and Energy	BAT/BEP	<ul style="list-style-type: none"> BAT/BEP guidelines translated in Thai language Workshops on dioxin analysis and development of BAT/BEP curricula for universities Assessment of 2 fossil-fuel fired utilities Standards on incinerators developed Training sessions held 	<ul style="list-style-type: none"> No specific outcomes reported for Thailand 	The evaluation report presents the conclusion of the terminal evaluation of the project as no specific outcomes were reported for Thailand
11	Regional Project: Demonstration of BAT and BEP in fossil-fired utility and industrial boilers in response to Stockholm Convention of POPs	GF/RAS/10/003/A 03; XP/RAS/11/002; GF/RAS/09/001	Environment and Energy	BAT/BEP fossil-fired and industrial boilers	<ul style="list-style-type: none"> Main planned outputs: training, upgrading of the existing legislation to include SC requirements, drafting and implementation of guidelines and guidance, and the establishment of a UP-POPs baseline inventory 	<ul style="list-style-type: none"> Guidelines and guidance on BAT/BEP adopted Pollution prevention methods applied prior to introduction of BAT/BEP Training program and regular curricula for universities developed 	<ul style="list-style-type: none"> Difficulty in reaching agreement with industrial partners Assessment of the cost-effectiveness of adopting BAT/BEP technology not carried out Difficulty to demonstrate effectiveness of BAT/BEP by means of a limited number of sampling and analyses in countries where the analytical capacity is limited

	Pipeline Projects	Status
1	<p>Greening Economy through Low Carbon SMEs Development in Thailand with OSMEP Budget: USD 1,880,000 Counterpart: Office of SME Promotion, MOI Donor: GEF</p>	<p>Project document is being finalized but as a follow up of the Industrial Energy Efficiency project focusing on SMEs (see above). Commitments of co-financing are being secured.</p>
2	<p>Reduction of GHG emission from Thai industries through promoting investment of the production and usage of solid bio-fuels Budget: USD 3,850,000 Counterparts: Green Industry Promotion and Development Office (GIPO), MOI Donor: GEF</p>	<p>Project document is being finalized (see above). Commitments of co-financing are being secured. The main project partner is hesitant to pursue the project due to the low fossil fuel price in the market.</p>
3	<p>GEF6- Greening Scrap Metal Value Chain through Promotion BAT/BEP for Scrap Pre-Treatment to Reduce UP-POPs Releases from Recycling Facilities Budget: USD 5,106,000 Counterparts: Department of Primary Industry and Mine (DPIM) under MOI Donor: GEF</p>	<p>The concept idea is included in the Thailand GEF National Portfolio Document for GEF 6. Currently, the GEF PIF is being reviewed at the Thailand GEF OFF Unit.</p>
4	<p>Application of Industry-Urban Symbiosis and Green Chemistry to reduce releases of POPs and hazardous chemicals as well as GHG emissions, to support inclusive and sustainable growth Budget: USD 9,200,000 Counterparts: Department of Industrial Works (DIW) under MOI Donor: GEF</p>	<p>The concept idea is included in the Thailand GEF National Portfolio Document for GEF 6. Currently, the GEF PIF is being reviewed at the Thailand GEF OFF Unit.</p>
5	<p>Regional Project on Climate Change Mitigation through South-South Transfer of Environmentally Sound Technology (TEST) Budget: USD 1,800,000 Counterparts: King Mongkut's University of Technology Thonburi (KMUTT) and National Science and Technology Development Agency under Ministry of Science and Technology (NSTDA) Donor: GEF</p>	<p>The concept idea is included in the Thailand GEF National Portfolio Document for GEF 6. Currently, the GEF PIF is being reviewed at the Thailand GEF OFF Unit.</p>
<p>Total Pipeline Projects: USD 20,406,267</p>		

Annex 2. Terms of Reference

TERMS OF REFERENCE FOR THE INDEPENDENT COUNTRY EVALUATION IN THAILAND

1. Introduction and background

An independent country evaluation of the activities and involvement of the United Nations Industrial Development Organization (UNIDO) in Thailand was proposed and included in the UNIDO Office for Independent Evaluation (ODG/EVA) Work Programme 2015. Other than project-related evaluations, no country or programme wide evaluation has been conducted by UNIDO in Thailand so far (and is more significant now that UNIDO has a relatively large project portfolio in the country).

The country evaluation will assess the efficiency, effectiveness, impact and sustainability of the UNIDO interventions in Thailand. This will include re-examination of the relevance of the objectives and the appropriateness of the design of the projects, specifically in regards to inclusive and sustainable industrial development (ISID). Moreover, the country evaluation will review the management and coordination of UNIDO intervention in Thailand as well as Global Forum activities covering Thailand.

The country evaluation is planned for the second quarter of 2015 and will be conducted by ODG/EVA staff (team leader) and two external independent evaluators (one international; one national).

Country context¹⁷

Thailand has an estimated population of 67 million of which about 15% live in the capital Bangkok. The country has made remarkable progress over the past two decades and it became an upper-middle income economy in 2011. Thailand is the second largest economy in the Association of Southeast Asia Nations (ASEAN) and the Greater Mekong Sub-region (GMS).

Economic growth has however been moderate over the past years due to different factors, in particular the global financial crisis, the floods of 2011 and political tension. The growth rate for 2014 is estimated at around 1.5%.

In terms of the GDP composition by sector (2013), the services sector is the largest (44.2%), closely followed by industry (43.6%), the proportion of agriculture being relatively small (12.1%). In terms of the ease of doing business, Thailand is listed among the top 30 economies worldwide and second among emerging economies of East Asia, particularly as a result of its public service improvement programme implemented over the past decade. The World Economic Forum ranks Thailand 31st in the Global Competitiveness Report 2014-2015.

There has been a substantial reduction in poverty incidence, from 42% in 2000 to 13.2% in 2011. The vast majority (more than 80%) of the country's poor live in rural areas. The

¹⁷ Sources: UN, UNDP, WB, ADB, WEF

Human Development Index (HDI) for Thailand ranked the country 103rd out of 186 countries, positioning Thailand close to the top of the “medium human development” category. The country has met most of its Millennium Development Goals (MDGs).

As an upper-middle income economy, the country faces major imbalances in terms of wealth distribution. There are in particular economic and social gaps between urban and rural areas and the majority of jobs are in the informal sector. Also, notwithstanding progress with respect to gender equality in primary and secondary education, gender disparities persist in other fields. Another concern relates to the effects (risks) of climate change.

Accordingly, its 11th National Economic and Social Development Plan (NESDP) 2012-2016 (Office of the Prime Minister) has the following priorities:

1. Human and social development toward a quality society;
2. Restructuring the economy toward inclusive growth;
3. Management of natural resources and the environment toward sustainability.

Under each of these core areas a range of sub-priorities have been set in the Plan. As regards the industrial sector, there is emphasis on knowledge-based and eco-friendly industries with special attention to SMEs.

International cooperation

In line with the country’s middle-income status, it is Thailand’s desire to become a partner of former donors, as opposed to a recipient of international aid. Moreover, the country wants to play an active role in the development of poorer countries through its “Forward Engagement” foreign policy. In this respect the country is keen to share its expertise and plays a leading role in regional and sub-regional cooperation initiatives in areas including trade, investment and tourism, through bodies such as ASEAN, GMS and others.

As regards the UN System, the overall size of the UN support for Thailand is modest, which reflects the country’s improved development status. The United Nations (UN) cooperation with the country is formulated in a UN Partnership Framework (**UNPAF**). Under the previous UNPAF 2007-2011, UNIDO’s role featured in particular with respect to social services and protection (strengthening livelihood and promoting self-employment), as well as south-south cooperation issues. The initial 2012-2016 UNPAF aimed to contribute to the above-mentioned National Economic and Social Development Plan (NESDP), and UNIDO’s role was focused in particular on the two following Joint Partnerships (JP): the JP on strategic information (its goal being that statistical and information systems inform policy development to reduce inequalities) and the JP on Climate Change (with the goal to enhance national development policies towards climate resilience and environmental sustainability). In May 2014, in light of the political troubles that the country was then facing, the UNCT agreed to substantially revise the 2012-2016 UNPAF. The participants agreed to focus the UN work on three major areas: (1) inequality and inclusivity; (2) the democratization process, including human rights and decentralization; and (3) climate change. In addition, the JPs are no longer operational.

Moreover, the UN teams were envisaged to work together with government counterparts through Joint Teams in six priority areas (social protection; human rights and access to justice; strategic information; climate change; international cooperation; and creative economy) and through Thematic Working Groups. All the Joint Teams have been suspended.

All Bangkok-based UN agencies with a regional mandate (hence also the UNIDO Office) take part in an annual regional coordination meeting, under the aegis of UNESCAP.

2. UNIDO in Thailand

There is long history of cooperation between Thailand and UNIDO. Focusing on the more recent past, UNIDO opened the current Regional Office in Thailand on 11 February 2000. The Regional Office succeeded a country office in Thailand, which had been closed two years earlier. Thailand was among the countries with a first generation Integrated Programme, covering the period 1999-2005. This IP (not evaluated) suffered from low funding. Thereafter, there has not been any specific framework for Thailand-UNIDO cooperation, other than the wider UN cooperation framework (UNPAF) – *see above*. There is, however, a draft (unsigned) Country Agreement (2010). UNIDO works primarily with the Ministry of Industry (its main counterpart) and the Ministry of Natural Resources and Environment.

During the period 2000-2008, the majority of projects were of the preparatory assistance-type, and most UNIDO projects developed since 2008 are in the areas of environment and energy. All on-going projects are funded by GEF, covering a total budget of almost US\$ 10 million. There has been one UN Joint Programme on integrated highland livelihood development (which started in 2010 and was completed in 2013). For a list of on-going and completed country specific projects, reference is made to Table 1 below. In addition to the national projects, Thailand participates/has participated in a number of regional projects. These projects are listed in Annex A. Most of these regional projects are now completed.

The UNIDO Regional Office is headed by a UNIDO Representative (UR) supported by a team of four national staff (national officer, senior secretary, project assistant and driver). Moreover, the Ministry of Industry seconds a professional officer on a one-year rotating basis as well as a second driver.

Other than Thailand, this office covers, Cambodia, Lao People's Democratic Republic, Malaysia, and Myanmar. A Head of UNIDO Operations in each country supports it in its work in Cambodia and Lao PDR.

Table 1: Current cooperation between UNIDO and Thailand

On-going Projects		Status/Results
1	<p>Thailand's Industrial Energy Efficiency <i>Project Nos.:</i> GF/THA/11/001, XP/THA/11/002 Budget: USD 3,620,000 <i>Counterparts:</i> - Department of Industrial Promotion - Department of Alternative Energy Development and Efficiency - Thai Industrial Standards Institute <i>Donor:</i> GEF</p>	<ol style="list-style-type: none"> 1. Energy Management Standard's training tools and materials developed and being used. 2. National awareness campaign on ISO 50001 was launched. 5 awareness-raising workshops have been organized in various locations around the country with around 250 participants in total. 3. The project continues building the capacity of national experts and factory personnel (users) on ISO compliant Energy Management Standard. More than 50 national experts, more than 100 users have been trained. 4. The systems optimization's training tools and materials have been developed and being used. 5. The project continues to build capacity of national experts/factory personnel on how to optimize steam, compressed air, pumping and fans systems through various training programs. Altogether, the project has resulted in more than 35 certified national experts, more than 80 trained national experts, and almost 200 trained users. 6. The first vendor training on systems optimization has been held. 7. Baseline and focused group meetings held to harmonize EE financing evaluation criteria 8. The recognition program partially started. There were 39 national experts certified with certification and ceremony.
2	<p>Overcoming Policy, Market and Technological Barriers to Support Technological Innovation and South-South Technology Transfer: the Pilot Case of Ethanol Production from Cassava <i>Project Nos.:</i> GF/THA/12/001/A01, XP/THA/12/002, GF/THA/10/006, XP/THA/10/005 <i>Budget:</i> USD 2,600,000 <i>Counterpart:</i> King Mongkut's University of Technology Thonburi (KMUTT) <i>Donor:</i> GEF</p>	<ol style="list-style-type: none"> 1. A website http://www.aseancassava.info/ to disseminate and support the south-south technology transfer was developed and softly launched. 2. Manuals, tool kits and structured training programs for technology transfer have been developed and completed at the end of 2014. 3. Roadmap and awareness campaign on E5 in Vietnam has started in November 2014. 4. The project completed procurement process and started construction of a demonstration plant in Thailand with ethanol production capacity of 200 l/d. The demonstration plant is expected to be in operation during second quarter of 2015. 5. A baseline study of capacity of financial institutions and structure in Lao PDR and Myanmar was completed. 6. As a result of the baseline study, outline activities to support investment from private sector in Lao PDR to commercialize the technology were agreed upon in the third quarter of 2014. The activities will be implemented during 2015.
3	<p>Regional Project: Demonstration of BAT and BEP in Fossil-Fired Utility and Industrial Boilers in Response to Stockholm Convention of POPs (Regional project covering Cambodia, Lao PDR, Indonesia, Mongolia, Philippines and Thailand)</p>	<ol style="list-style-type: none"> 1. The project improved specifications for different types of boilers (small/ medium / large) and fuels. 2. PP/CP methodology was adopted. The corresponding technical capabilities in the fossil fuel-fired utility and industrial boilers sector for

On-going Projects	Status/Results
<p><i>Proj. Nos.:</i> GF/RAS/10/003/A03, XP/RAS/11/002, GF/RAS/09/001</p> <p><i>Total budget:</i> USD 4,000,000 for 6 countries Thailand budget only estimated: USD 660,000</p> <p>Thai Counterpart: Pollution Control Department, Ministry of Natural Resources and Environment (PCD)</p> <p><i>Donor:</i> GEF (3, cont.)</p>	<p>use in power generation and in industrial processes were strengthened.</p> <ol style="list-style-type: none"> 3. Baseline inventories on industrial boilers were completed in six participating countries. 4. Specific studies were conducted on: (i) fish residues as fuel in seasonal use in Cambodia; (ii) training for responsible persons for boiler operation of private and public sectors use of spent/used oils as boiler fuel; (iii) use of biomass fuels and iv) low pressure furnaces and coal stoves in Mongolia, etc. 5. PCD will finance a survey for Green Boiler Activities in Southeast Asian countries. 6. On-going awareness-raising campaigns for specific target groups such as government, policy makers, community leaders, managers of state owned industries and owners of private industries, schools, etc., and for the public at large are being conducted. For instance, in 2013 BAT/BEP animation created and financed by NIDA. 7. The project in partnership with NIDA established the BAT/BEP centre in NIDA as a centre of excellence in monitoring and assessment, specifically in sampling, analysis, and reporting of UP-POPs. 8. Promotion of technology transfer and investment by identification and implementation of innovative mechanisms for PPPs are being implemented. In Thailand: <ul style="list-style-type: none"> - Terms of Cooperation were signed with two companies. Red Bull and Olean Palm Oil, to invest in green boiler technologies with technical assistance from the project. - Red Bull retrofitted a technology called a micro emulsion device to improve combustion efficiency, reduce emissions and fuel consumption. - In December 2014, Olean Palm Oil installed a new, improved control system allowing air-to-fuel ratio optimization and economizer. - The dioxin test of both factories will be conducted in early 2015.
<p>4 Promoting Small Biomass Power Plants in Rural Thailand for Sustainable Renewable Energy Management and Community Involvement</p> <p><i>Project No.:</i> GF-100258, XP-100258, GF/THA/10/004, XP/THA/10/003</p> <p><i>Budget:</i> USD 975,000</p> <p>Counterpart: Office of Permanent Secretary, Ministry of Energy; Napoon Sub District, and Phare Provincial Administrative Offices; Science and Technology Research Institute</p> <p><i>Donor:</i> GEF</p>	<p>The 250 kW power plant engineering design and equipment has been procured from TERI (The Energy Resource Institute of India).</p> <p>Other activities to support the power plant's operation are under way including power purchase license, community participation and mobilization, and community enterprise's set up.</p>
<p>5 GEF UNIDO Cleantech Programme for SMEs in Thailand</p> <p><i>Project No.:</i> GEF-130312</p> <p><i>Budget:</i> USD 1,826,500</p> <p><i>Counterparts:</i> Department of Industrial Promotion (DIP), MOI</p>	<p>The project received the clearance from DIP to start implementation in November 2014. The project is in an inception phase of the implementation. The inception seminar will be held during first quarter of 2015.</p>

On-going Projects		Status/Results
	<i>Donor:</i> GEF	
6	<p>GEF 5 Preparatory Assistance: Greening Economy through Low Carbon SMEs Development in Thailand with OSMEP</p> <p><i>Project No.:</i> GEF (PPG)-130075</p> <p><i>Budget:</i> USD 34,000</p> <p><i>Counterpart:</i> Office of SME Promotion, MOI</p> <p><i>Donor:</i> GEF</p>	Project document is being finalized. Commitments of co-financing are being secured.
7	<p>GEF5 5 Preparatory Assistance: Reduction of GHG emission from Thai industries through promoting investment of the production and usage of solid bio-fuels</p> <p><i>Project No.:</i> GEF (PPG)-130319</p> <p><i>Budget:</i> USD 150,000</p> <p><i>Counterparts:</i> Green Industry Promotion and Development Office (GIPO), MOI</p> <p><i>Donor:</i> GEF</p>	Project document is being finalized. Commitments of co-financing are being secured.
Total On-going Projects:		US\$ 9,865,500

	Pipeline Projects	Status
1	<p>Greening Economy through Low Carbon SMEs Development in Thailand with OSMEP Budget: USD 1,880,000 Counterpart: Office of SME Promotion, MOI Donor: GEF</p>	Project document is being finalized (see above). Commitments of co-financing are being secured.
2	<p>Reduction of GHG emission from Thai industries through promoting investment of the production and usage of solid bio-fuels Budget: USD 3,850,000 Counterparts: Green Industry Promotion and Development Office (GIPO), MOI Donor: GEF</p>	Project document is being finalized (see above). Commitments of co-financing are being secured.
3	<p>GEF6- Greening Scrap Metal Value Chain through Promotion BAT/BEP for Scrap Pre-Treatment to Reduce UP-POPs Releases from Recycling Facilities Budget: USD 5,106,000 Counterparts: Department of Primary Industry and Mine (DPIM) under MOI Donor: GEF</p>	<p>The concept idea is included in the Thailand GEF National Portfolio Document for GEF 6.</p> <p>Currently, the GEF PIF is being reviewed at the Thailand GEF OFP Unit. The GEF OFP will grant the GEF OFP Endorsement Letter within March 2015. The GEF PIF is expected to be submitted to the GEF in March 2015.</p>
4	<p>Application of Industry-Urban Symbiosis and Green Chemistry to reduce releases of POPs and hazardous chemicals as well as GHG emissions, to support inclusive and sustainable growth Budget: USD 9,200,000 Counterparts: Department of Industrial Works (DIW) under MOI Donor: GEF</p>	<p>The concept idea is included in the Thailand GEF National Portfolio Document for GEF 6.</p> <p>Currently, the GEF PIF is being reviewed at the Thailand GEF OFP Unit. The GEF OFP will grant the GEF OFP Endorsement Letter within March 2015. The GEF PIF is expected to be submitted to the GEF in March 2015.</p>
5	<p>Regional Project on Climate Change Mitigation through South-South Transfer of Environmentally Sound Technology (TEST) Budget: USD 1,800,000 Counterparts: King Mongkut's University of Technology Thonburi (KMUTT) and National Science and Technology Development Agency under Ministry of Science and Technology (NSTDA) Donor: GEF</p>	<p>The concept idea is included in the Thailand GEF National Portfolio Document for GEF 6.</p> <p>Currently, the GEF PIF is being reviewed at the Thailand GEF OFP Unit. The GEF OFP will grant the GEF OFP Endorsement Letter within March 2015. The GEF PIF is expected to be submitted to the GEF in March 2015.</p>
Total Pipeline Projects:		USD 20,406,267

3. The country evaluation: Rationale and purpose

The evaluation will be a forward-looking exercise and seek to identify good practices and areas for improvement in order to draw lessons to enhance the performance of UNIDO's support in Thailand. The country evaluation will attempt to assess in a systematic and objective manner the relevance, efficiency, effectiveness, impact and sustainability of UNIDO's interventions implemented since 2008 until now. This will include the re-examination of the relevance of the objectives of these interventions and of the appropriateness of their design.

Overall, the main purposes of the country evaluation are to assess the:

- Relevance of UNIDO's past and on-going interventions in Thailand in relation to national industrial priorities, strategies and needs and the regional and global development agenda, including the extent to which projects are in line with UNIDO's Inclusive and Sustainable Industrial Development (ISID) Agenda and their contribution to UNPAF objectives (to the extent the latter have been operationalized);
- Appropriateness of project designs and the degree of country ownership in design and implementation;
- Efficiency of UNIDO's interventions, such as in terms of the quality and timeliness of its services;
- Effectiveness of UNIDO's interventions in terms of achievement of outputs and outcomes against their objectives;
- Impact and sustainability of UNIDO's interventions.
- Current and potential role of this regional office (taking into consideration eventual opportunities for rationalization of UNIDO's field presence in Asia, including resources required, should the coverage of the office in Bangkok be widened as part of UNIDO's strategic vision with respect to field representation in Asia).

Crosscutting issues will be mainstreamed in the evaluation; in this case specifically gender equality and south-south cooperation. Other issues covered will be, e.g., management, coordination and cooperation issues, including also synergies between UNIDO projects and linkages with related support of other donors/agencies. Moreover, UNIDO's involvement and/or participation in global forum activities in Thailand will be assessed (i.e., those activities initiated by UNIDO or the United Nations System that are aimed at exchanging knowledge and information as well as facilitating partnerships)..

The assessment will also cover the issue of funds mobilisation, taking into consideration that in Thailand the main source of funding has been GEF. In this respect the review will assess to what extent there would be also opportunities for service offerings by UNIDO in fields other than environment and energy (and, in the affirmative, which would be the likely sources of funding/donors for such work, including also self-financing by Thailand).

The evaluation is to generate findings and draw lessons that can feed into future UNIDO projects and programmes in Thailand, in the other countries covered by the Regional Office and possibly elsewhere. Overall, the findings are expected to inform discussions on a future cooperation between Thailand and UNIDO. The key users of the evaluation findings will be the UNIDO Representation in Thailand, UNIDO management and staff at Headquarters, the Government of Thailand, counterpart agencies and other organizations in the country cooperating with UNIDO, donors, members of the UN Country Team and, not the least, beneficiaries. For these stakeholders the evaluation findings and recommendations are expected to provide key inputs for the planning and continuous improvement of future cooperation activities.

4. Scope and focus

The country evaluation will cover the full range of UNIDO's support to Thailand since 2008 to present. It will assess the relevance of UNIDO interventions, synergies among them, why projects have succeeded or failed/face problems, and identify good practices and lessons learned. In addition to (i) a general portfolio review, the evaluation will (ii) review the performance and impact of *selected* individual projects (clustered by theme). The evaluation will furthermore review (iii) coordination and management arrangements and functions, including the role of the Regional UNIDO Office, in particular its positioning in the country (which is a UN regional hub). This includes an assessment of its participation in Joint Teams and Working Groups (UN/wider donor cooperation mechanisms) and its contribution to UNPAF priorities.

As regards the selection of **individual projects** to be reviewed (in addition to the portfolio review), it is to be noted that three out of the seven *on-going* projects (all GEF-funded) will be evaluated in the course of 2015/16. The current evaluation will cover these three on-going projects in a general manner, focusing on issues such as relevance, ownership, synergies and the overall state of implementation. The findings of the project evaluations will feed into the country evaluation. Moreover, the other three on-going projects are recently approved, making it premature to assess the results of these projects. For these three recently approved projects, the assessment will focus on their relevance and overall design.

Concerning the *completed* projects, the UN Joint Programme (TF/THA/09/004, Livelihood development) has been already evaluated by the UN lead agency (FAO) in November 2013, so the current evaluation will assess the follow-up of recommendations. The completed trade capacity building projects (XP/THA/08/001; EE/THA/08/002; US/THA/07/001 - upgrading of chemical testing laboratories - and TE/THA/10/001; TE/THA/10/002; EE/THA/08/003 - upgrading of testing laboratories for food and agricultural products) will be reviewed as a cluster of projects. Even if the individual projects were relatively small and are completed, the evaluation will assess to what extent and how the upgraded laboratory facilities have been used and UNIDO's overall contribution to the development of quality infrastructure.

With respect to the **regional projects**, one project is *on-going* (TF/RAS/09/004, NEEM, building on a prior phase) and provides an opportunity to assess the role of Thailand in this project (as beneficiary, source of expertise or otherwise). The regional project related to the Stockholm Convention in the ESEA region was already evaluated in 2014 and the country evaluation will assess the follow-up of its recommendations with respect to Thailand.

In brief, the country evaluation does not replace or duplicate the independent evaluations of individual projects, yet will assess the follow-up of recommendations of prior project evaluations and use the findings of forthcoming project evaluations as inputs to the country evaluation.

The country evaluation will take into consideration in particular the following past evaluations which addressed issues relevant to the country/region:

- Independent thematic evaluation of UNIDO's Field Office Performance, 2013;
- Programme-wide final evaluation of project TF/THAI/09/004 – UN Joint Programme on integrated highland livelihood development in Mae Hong Son), 2013;
- Thematic evaluation of UNIDO's work in the area of Persistent Organic Pollutants (POPs), 2012, including the independent cluster evaluation of UNIDO projects covering enabling activities to review and update the National Implementation Plans for the Stockholm Convention on POPs (on-going);

- Independent evaluation of GF/RAS/10/006, regional plan for the introduction of BAT/TEP strategies to industrial source categories of Stockholm Convention Annex C of Article 5 in ESEA region (POPs), 2014.

The exact scope of the country evaluation will be decided during the inception period. The evaluation will be participatory and involve stakeholders, including national counterparts, donors and beneficiaries as well as UNIDO project managers and project staff.

5. Evaluation issues and key evaluation questions

The evaluation will assess the general project portfolio, zoom in on selected (groups of) individual projects and assess the role of the Regional Office and aims at answering the questions below.

A. Project portfolio review

Relevance

The degree to which the design and objectives of UNIDO's projects (national/regional; on-going/completed) in the portfolio is consistent with the needs and priorities of the country as well as with UNIDO's strategic priorities. In particular, the extent to which the projects were relevant to:

- Government strategies and priorities in particular as regards industrial development, reflected in the National Industrial Development Strategy;
- the UNPAF objectives (to the extent operationalized);
- UNIDO's strategic priorities, in particular, ISID, UNIDO Programme and Budget, medium-term strategic framework, UNIDO's policy on Gender Equality and the Empowerment of Women, the Lima Declaration, and the Green Industry agenda;
- the different target groups (counterparts and beneficiaries);
- donors (primarily GEF).

Synergies and complementarities

The extent to which there have been

- linkages between national UNIDO projects;
- linkages between national and regional UNIDO projects;
- linkages with programmes and projects of other development partners in Thailand/the region, including initiatives of other UN agencies.

B. Review of selected projects

Project design

The extent to which

- the project has clearly focused outcomes and outputs, including gender equality considerations;
- the project document includes a coherent logical framework that is results-oriented and has measurable indicators;
- as regards regional projects: the envisaged role and participation of Thailand as per the design of the projects.

Relevance and ownership

The degree to which the objectives of the selected UNIDO projects are consistent with the needs of the country, with its National Industrial Development Strategy and related priorities as well as with UNIDO's strategic priorities.

The extent to which:

- the project was formulated with participation of the national counterpart(s) and/or target beneficiaries, in particular private enterprises and other industry related stakeholders;
- the counterpart(s) has (have) been appropriately involved and was (were) participating in the identification of the critical problem areas and in the development of the project strategy, and were actively supporting its implementation.

Efficiency

The extent to which:

- UNIDO provided high quality services (expertise, training, equipment, methodologies, technologies, etc.) that led to the production of outputs;
- the resources and inputs were converted to results in a timely and cost-effective manner;
- synergies and coherence between different UNIDO projects and with related programmes and projects of other donors/agencies lead to collaboration and cooperation among stakeholders and to the production of outputs;
- the same results could have been achieved in another, more cost-effective manner;
- women and men benefitted equally from the projects;
- outputs were produced in a timely manner;
- procurement process/services were efficient.

Effectiveness

The extent to which the projects achieved their objectives and major factors influencing the achievement or non-achievement of the objectives.

The extent to which:

- objectives/results (outcomes and outputs) as formulated in project documents were achieved and how the stakeholders perceive their quality and the beneficiaries use these;
- factors (to be identified) influenced the achievement or non-achievement of the objectives;
- direct and ultimate beneficiaries were actually reached.

Sustainability

The likely continuation of benefits from a project after the project has been completed. The extent to which:

- a sustainability strategy was formulated;
- there is continued commitment and ownership by the government and other national stakeholders to continue / replicate the project;
- *for on-going projects*: the likelihood that changes or benefits can be maintained in the long term from a technical, organizational and financial perspective;
- *for completed projects*: indications of service capacities in place and the degree of cost recovery.

Impact

The positive and negative changes produced by a development intervention, directly or indirectly, intended or unintended. The extent to which the projects contributed (directly or indirectly, in an intended or unintended manner) to:

- developmental results (economic, environmental, social);
- the achievement of the MDGs and national development goals;
- ISID related objectives.

Project management

The extent to which:

- efficient cooperation arrangements were established between the Headquarters and project staff and with the UNIDO Regional Office in Thailand;
- UNIDO HQ-based management, coordination and monitoring have been efficient and effective;
- project management and monitoring systems were adequate, including the role of the project partners, where applicable.

Crosscutting issues

The extent to which the projects addressed the main cross-cutting issues, i.e., their contribution to:

- the empowerment of women and gender equality;
- environmental sustainability (for other than environment related interventions); and
- fostering South-South and sub-regional co-operation, including the role of Thailand (as source of expertise) in the implementation of the regional projects.

C. Partnership and coordination

The extent to which:

- effective cooperation mechanisms and agreements with Government counterparts were established (including the contribution of Thailand to the UNIDO Office);
- UNIDO occupies a strategic position in the country (a regional UN hub);
- the adequacy of the office set-up and capacity, i.e., current staffing versus capabilities and skills needed to perform the key functions of this regional office as defined in the Terms of Reference of this office including work plan, as well as the adequacy of the annual office budget in this respect;
- the Regional Office plays an effective role with respect to the two UNIDO Desks which exist in its countries of coverage (programmatic, technical and administrative support);
- UNIDO contributed to and was part of the United Nations Development Assistance Framework (UNPAF) Thailand, to the extent UNPAF is operational;
- UNIDO collaborates with other UN agencies and with other development partners (cooperation; cost-sharing), including also participation in regional UN mechanisms/bodies;
- UNIDO played a role with respect to global forum (GF) activities (UNIDO/other GF activities with regard to industrial development implemented in Thailand or in which Thailand has participated);
- the middle-income status of the country affects funds mobilization opportunities for projects in fields other than environment and energy.

The detailed approach that will be used will be specified in the inception report.

6. EVALUATION APPROACH AND METHODOLOGY

These TORs provide some information as regards the methodology but this should not be regarded as exhaustive. It is instead meant to guide the evaluation team in elaborating a more detailed evaluation methodology and tools that should be further detailed in the inception report.

In terms of data collection the evaluation team should use a variety of methods ranging from desk review (project documents, progress reports, mission reports, Infobase search, SAP search, evaluation reports, other) to individual interviews with counterparts and other stakeholders including beneficiaries, focused group discussions, statistical analysis, surveys (where appropriate) and direct observation at project sites.

The evaluation team should ensure that the findings are evidence based. This implies that all perceptions, hypotheses and assertions obtained in interviews will be validated through secondary filtering and cross checks by a triangulation of sources, methods, data, and theories.

While maintaining independence, the evaluation will be carried out based on a participatory approach, which seeks the views and assessments of all stakeholders. These include government counterparts, private sector representatives, other UN organizations, donors, and beneficiaries, in addition to UNIDO- and project staff.

7. TIME SCHEDULE

The country evaluation is scheduled to take place during the fourth quarter of 2015. Table 3 below presents the preliminary schedule.

Table 2 - Preliminary time schedule

Activity	Estimated date
Collection of documentation by ODG/EVA	October 2015
Desk review by members of the evaluation team	Early November 2015
Initial interviews at UNIDO HQ to assess the scope of the country evaluation	Second week of November 2015
Inception report	Mid-November 2015
Field work in Thailand (2 weeks) and presentation of preliminary findings to the government and local counterparts, as well as the RO	Second half of November 2015
Presentation of preliminary findings at UNIDO HQ	Second week of December 2015
Drafting of evaluation report	December 2015
Collection and incorporation of comments into draft evaluation report	December 2015
Issuance of final evaluation report	December 2015

8. EVALUATION TEAM COMPOSITION

The evaluation team will include:

- One ODG/EVA staff member who will also act as evaluation manager;
- One or two senior international evaluation consultants with experience in the thematic areas of the main projects in the country portfolio;
- One national evaluation consultant.

The international and national evaluation consultants will be contracted by UNIDO. The tasks of the consultants are specified in their respective job descriptions, attached to this ToR as annex B. One of the international evaluation consultants will also have the role of team leader.

None of the members of the evaluation team must have been involved in the design and/or implementation, supervision and coordination of any intervention to be assessed by the evaluation and/or have benefited from the programme/ projects under evaluation.

The UNIDO Field Office in Thailand will support the evaluation team and assist in the planning and coordinating of the evaluation mission.

A proactive involvement of the national counterpart ministry could be envisaged through a secondment of its own evaluator(s) as member(s) of the evaluation team. The national counterparts will be informed that such a joint evaluation is a possibility. The necessary funding should be set aside by the national counterpart in advance and outside the UNIDO evaluation budget.

9. EVALUATION PROCESS AND REPORTING

The evaluation will use a participatory approach and involve various stakeholders at the different stages in the evaluation process. The responsibilities for the various evaluation stages and outputs are outlined below.

	ODG/EVA	PTC	UNIDO Field Office	Government of Thailand and national counterparts	Evaluation team
Selection of consultants	X				
Review of background documentation					X
Interviews at UNIDO HQ and (during the field mission) of the Field/Regional Office		X	X		X
Inception report					X
Evaluation mission				X	X
Presentation of preliminary findings in the field				X	X
Presentation of preliminary findings at HQ	X				X
Drafting of evaluation report					X
Comments on draft report	X	X	X	X	
Final evaluation report					X

Evaluation deliverables such as the inception report and the evaluation report will be approved by the Evaluation Manager, ODG/EVA.

The evaluation team will present its preliminary findings to (i) the Government, other key national stakeholders and staff of the Field Office/project staff at the end of the field mission and to (ii) staff at UNIDO Headquarters. A draft evaluation report will be circulated for comments and factual validation. The reporting language will be English.

The ToR and the draft evaluation report will be shared with the national counterparts, the main donor (GEF) and relevant UNIDO staff members for comments and factual validation.

This consultation also seeks agreement on the findings and recommendations. The evaluators will take comments into consideration when preparing the final version of the report. The final evaluation report will be submitted 6-8 weeks after the field mission, at the latest, to the Government of Thailand and other national stakeholders, to the donor and to UNIDO.

10. DELIVERABLES

The following deliverables will be produced by the evaluation team:

- Inception report
- Draft report
- Final report

11. QUALITY ASSURANCE

All UNIDO evaluations are subject to quality assessments by the UNIDO Office for Independent Evaluation. Quality control is exercised in different ways throughout the evaluation process (briefing of consultants on EVA methodology and process, review of inception report and evaluation report). The quality of the evaluation report will be assessed and rated against the criteria set forth in the checklist on evaluation report quality in annex C.

12. ANNEXES

- A. List of on-going/completed regional/global projects
- B. Job descriptions for consultants
- C. Tentative evaluation report outline
- D. Checklist on evaluation report quality
- E. Reference documents

ANNEX B OF TERMS OF REFERENCE: JOB DESCRIPTIONS FOR TEAM MEMBERS

INDEPENDENT UNIDO COUNTRY EVALUATION – THAILAND

Title:	Senior international evaluation consultant – Team Leader
Main duty station and location:	UNIDO HQ (Vienna, Austria), Thailand, and home-based
Mission/s to:	UNIDO HQ (Vienna, Austria), Thailand
Start of contract (EOD):	26 October 2015
End of contract (COB):	31 December 2015
Number of working days:	32 days over 2 months

ORGANIZATIONAL CONTEXT

The Office for Independent Evaluation (ODG/EVA) is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides factual information about result and practices that feed into the programmatic and strategic decision-making processes.

PROJECT CONTEXT

Reference attached terms of reference.

Duties: The senior international evaluation consultant will participate in the country evaluation in Thailand according to the evaluation terms of reference. She/he will participate in all evaluation activities and contribute, inter alia, to the assessments and to the preparation of the evaluation report as per assigned tasks and under the direction of the team leader (ODG/EVA staff member). He/she will perform the following tasks:

MAIN DUTIES	Expected duration	Location	Concrete/measurable outputs to be achieved
Preparatory phase <ul style="list-style-type: none"> ○ Study related programme and project documentation (including progress reports and documentary outputs) ○ Study relevant background information (national policies, international frameworks, other) ○ Study available evaluation reports 	5 days	Home-based	Analytical overview of available documents and of UNIDO activities in Thailand
Briefing with ODG/EVA <ul style="list-style-type: none"> ○ Inputs to methodology and interview guidelines ○ Interviews with project managers and key stakeholders at HQ ○ Preparation of the inception report 	3 days	UNIDO HQ (Vienna)	Key issues of evaluation identified Scope of evaluation clarified Inception report, including

MAIN DUTIES	Expected duration	Location	Concrete/measurable outputs to be achieved
			the proposed methodology, approach and evaluation programme approved by ODG/EVA
Field mission to Thailand <ul style="list-style-type: none"> ○ Carry out meetings, visits and interviews with stakeholders according to the evaluation programme ○ Drafting the main conclusions and recommendations, and present them to stakeholders ○ Contribute to draft evaluation report outline/structure (based on distribution of writing tasks agreed upon within the team) 	11 days (including travel)	Thailand, Bangkok (with in-country travel)	Information gathered on issues specified in TOR Draft conclusions and recommendations Agreement on structure and content of evaluation report; distribution of writing tasks
Debriefing at UNIDO HQ, Vienna <ul style="list-style-type: none"> ○ Present preliminary findings and recommendations to the stakeholders at UNIDO ○ Carry out additional interviews if necessary 	3 days (including travel)	UNIDO HQ	Feedback on preliminary findings
Evaluation report <ul style="list-style-type: none"> ○ Preparation of the evaluation report (drafting sections/chapters under his/her scope) ○ Review/adapt the evaluation report in light of additional evidence presented or factual corrections made ○ Integrate comments from ODG/EVA and stakeholders with regard to assessment, recommendations and lessons ○ Finalization of the evaluation report 	10 days	Home-based	Draft report and final report
Total	32 days		

REQUIRED COMPETENCIES

Core values and competencies:

1. Integrity
2. Professionalism
3. Respect for diversity
4. Results orientation and accountability
5. Planning and organizing
6. Communication and trust
7. Team orientation
8. Judgement and decision making
9. Conflict resolution

MINIMUM ORGANIZATIONAL REQUIREMENTS

Education: Advanced university degree in economics, development or environmental studies and/or other fields related to industrial development.

Technical and functional experience:

- More than 15 years of experience in technical cooperation, project management and/or evaluation
- Extensive experience in evaluation as part of an evaluation team;
- Extensive knowledge about multilateral technical cooperation and the UN, international development priorities and frameworks (MDGs, Paris Declaration, One UN, etc.);
- Knowledge of issues related to sustainable industrial development and of UNIDO activities an asset;
- Working experience within the UN system an asset;
- Working experience in Thailand an asset.

Languages: Fluency in written and spoken English is required.

Absence of Conflict of Interest:

According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and management of and/or have been a stakeholder of the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultant will not seek assignments with the manager/s in charge of the project before the completion of her/his contract with the Office for Independent Evaluation.

INDEPENDENT UNIDO COUNTRY EVALUATION – THAILAND

Title:	Senior national evaluation consultant
Main Duty Station and Location:	Home-based and various locations in Thailand
Mission/s to:	Thailand (in-country travel)
Start of Contract (EOD):	November 2015
End of Contract (COB):	December 2015
Number of Working Days:	22 days spread over 2 months

ORGANIZATIONAL CONTEXT

The Office for Independent Evaluation (ODG/EVA) is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides factual information about result and practices that feed into the programmatic and strategic decision-making processes.

PROJECT CONTEXT

See evaluation terms of reference (attached).

Duties: As a member of the evaluation team and under the supervision of the evaluation team leader, the consultant will participate in the independent country evaluation in Thailand according to the terms of reference attached. He/she will participate in all evaluation activities and contribute to the assessments in particular with a view to assessing the UNIDO activities in the light of national objectives, strategies and policies, cooperation priorities and institutional capacities. In particular, he/she will be expected to perform the following duties:

MAIN DUTIES	Concrete/measurable outputs to be achieved	Expected duration	Location
<ul style="list-style-type: none"> • Study relevant programme and project documentation including progress reports and documentary outputs and TOR; • Study relevant background information (national policies, international frameworks, other) • Assist in the preparation of the evaluation mission in close consultation with UNIDO Regional Office staff in Thailand and relevant government counterparts. 	<p>Analytical overview of available documents; list of issues to be clarified</p> <p>Background data needed for evaluation collected at field level</p> <p>Evaluation mission programme</p> <p>Inputs to inception report</p>	6 days	Home-based

MAIN DUTIES	Concrete/measurable outputs to be achieved	Expected duration	Location
<p>Evaluation team field mission</p> <ul style="list-style-type: none"> Participate actively in meetings, visits and interviews according to the evaluation programme; Participate in drafting the main conclusions and recommendations, and in its presentation to stakeholders in accordance with the instructions of the team leader. 	<p>Notes, tables; and information gathered on issues specified in ToR</p> <p>Draft conclusions and recommendations</p>	8 days	In-country travel (Thailand)
Carry out additional interviews as required.	Interview protocols, findings incorporated in evaluation report	3 days	In-country travel (Thailand)
Participate in the preparation/review of the report according to the instructions of the team leader (including the provision of country specific background information and national context inputs to the report).	Inputs to the report	5 days	Home-based
Total		22 days	

REQUIRED COMPETENCIES

Core values and competencies

1. Integrity
2. Professionalism
3. Respect for diversity
4. Results orientation and accountability
5. Planning and organizing
6. Communication and trust
7. Team orientation
8. Judgement and decision making
9. Conflict resolution

MINIMUM ORGANIZATIONAL REQUIREMENTS

Education: University degree (master level or equivalent) in social sciences, business or a field relevant to industrial development.

Technical and functional experience:

- Good knowledge of Thailand's industrial development situation, institutions and programmes;
- Working experience with international organizations and the UN system;
- Experience in the evaluation of trade capacity building support will be an advantage

Languages: Fluency in written and spoken English is required.

Absence of Conflict of Interest:

According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and management of and/or have been a stakeholder of the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultant will not seek assignments with the manager/s in charge of the project before the completion of her/his contract with the Office for Independent Evaluation.

ANNEX C OF TERMS OF REFERENCE: TENTATIVE EVALUATION REPORT OUTLINE

Acronyms and Abbreviations

Glossary of Terms

Executive Summary

MAIN REPORT:

I. BACKGROUND

1. Background and introduction

- Evaluation objectives
- Methodology
- Evaluation process
- Limitations of evaluation

2. Country context

- Historical context
- Brief overview of recent economic development
- Industrial situation and relevant sector specific information
- Development challenges facing the country
- Relevant Government policies, strategies and initiatives
- Initiatives of international cooperation partners

3. Description of UNIDO activities in the country

- Major TC components, main objectives and problems they address
- Brief overview of other important activities

II. ASSESSMENT

4. Performance of TC activities

- Poverty Reduction through Productive Activities
- Trade capacity building
- Energy and Environment

5. Performance in cross-cutting issues

- Gender
- Environment
- South-South cooperation

III. MAIN CONCLUSIONS AND RECOMMENDATIONS

- Main conclusions from section II will be used as a basis for recommendations.

IV. LESSONS LEARNED

V. ANNEXES

- Annex A: Terms of reference
- Annex B: List of persons met
- Annex C: Bibliography
- Annex D: Project assessments and reviews
- Annex E: Country map and project sites
- Annex F:

ANNEX D OF TERMS OF REFERENCE: CHECKLIST ON EVALUATION REPORT QUALITY

Independent UNIDO country evaluation, THAILAND

Evaluation team leader:

Quality review done by:

Date:

Report quality criteria	UNIDO Office for Independent Evaluation: Assessment notes	Rating
Report Structure and quality of writing		
The report is written in clear language, correct grammar and use of evaluation terminology. The report is logically structured with clarity and coherence. It contains a concise executive summary and all other necessary elements as per TOR.		
Evaluation objective, scope and methodology		
<p>The evaluation objective is explained and the scope defined.</p> <p>The methods employed are explained and appropriate for answering the evaluation questions.</p> <p>The evaluation report gives a complete description of stakeholder’s consultation process in the evaluation.</p> <p>The report describes the data sources and collection methods and their limitations.</p> <p>The evaluation report was delivered in a timely manner so that the evaluation objective (e.g. important deadlines for presentations) was not affected.</p>		
Evaluation object		
<p>The logic model and/or the expected results chain (inputs, outputs and outcomes) of the object is clearly described.</p> <p>The key social, political, economic, demographic, and institutional factors that have a direct bearing on the object are described.</p> <p>The key stakeholders involved in the object implementation, including the implementing agency(s) and partners, other key stakeholders and their roles are described.</p> <p>The report identifies the implementation status of the object, including its phase of implementation and any significant changes (e.g. plans, strategies, logical frameworks) that have occurred over time and explains the implications of those changes for the evaluation.</p>		

Findings and conclusions		
<p>The report is consistent and the evidence is complete (covering all aspects defined in the TOR) and convincing.</p> <p>The report presents an assessment of relevant outcomes and achievement of project objectives.</p> <p>The report presents an assessment of relevant external factors (assumptions, risks, impact drivers) and how they influenced the evaluation object and the achievement of results.</p> <p>The report presents a sound assessment of sustainability of outcomes or it explains why this is not (yet) possible.</p> <p>The report analyses the budget and actual project costs.</p> <p>Findings respond directly to the evaluation criteria and questions detailed in the scope and objectives section of the report and are based on evidence derived from data collection and analysis methods described in the methodology section of the report.</p> <p>Reasons for accomplishments and failures, especially continuing constraints, are identified as much as possible.</p> <p>Conclusions are well substantiated by the evidence presented and are logically connected to evaluation findings.</p> <p>Relevant crosscutting issues, such as gender, human rights, and environment are appropriately covered.</p>		
Recommendations and lessons learned		
<p>The lessons and recommendations are based on the findings and conclusions presented in the report.</p> <p>The recommendations specify the actions necessary to correct existing conditions or improve operations ('who?' 'what?' 'where?' 'when?').</p> <p>Recommendations are implementable and take resource implications into account.</p> <p>Lessons are readily applicable in other contexts and suggest prescriptive action.</p>		

Rating system for quality of evaluation reports

A number rating 1-6 is used for each criterion: Highly Satisfactory = 6, Satisfactory = 5, Moderately Satisfactory = 4, Moderately Unsatisfactory = 3, Unsatisfactory = 2, Highly Unsatisfactory = 1, and unable to assess = 0.

ANNEX E OF TERMS OF REFERENCE: REFERENCE DOCUMENTS

Project documents (of projects listed in tables 1 and 2)

Project progress reports

Back-to-office mission reports (Project Managers)

Periodic reports of UNIDO Field Office in Thailand

UNPAF Thailand, 2012-2016 (2011)

UNIDO independent thematic evaluation of UNIDO's Field Office Performance, 2013

UNIDO independent thematic evaluation of UNIDO's work in the area of persistent organic pollutants (POPs), 2012

UNIDO independent terminal evaluation: Regional plan for the introduction of BAT/BEP strategies to industrial source categories of Stockholm Convention Annex C of Article 5 in ESEA Region (Project: GF/RAS/10/006) (2014)

UNIDO Evaluation guidelines (2010)

UNIDO Evaluation Policy (2015)

Evaluation of the joint UN Programme (livelihood development), 2013

World Bank, Thailand overview

World Bank, Doing business 2015

World Economic Forum. Global Competitiveness Report 2014-15

UNDP, Thailand Human Development Report 2014

UNDP-UNEP, Building inclusive green economies –stories of change from the poverty-environment initiative in Asia-Pacific, 2014

Annex 3: List of people met

Name	Job title/Position and Affiliation
UNIDO HQ	
Javier Guarnizo	Senior Evaluation Officer and UNIDO Evaluation Team Member
Simone La Rosa Monier	Senior Evaluation Assistant, Office for Independent Evaluation
Kitsiri Kaewpipat	Minister Counsellor (Industry), Royal Thai Embassy, Austria
Peraphan Jittrapiron	Assistant to Minister Counsellor (Industry), Royal Thai Embassy, Austria
Imran Farooque	Chief, Asia and the Pacific Bureau
Sanjaya Shrestha	Project Manager for Industrial Energy Efficiency Project
Jossy Thomas	Project Manager for several GEF projects
Khac Tiep Nguyen	Industrial Development Officer
Toshiyuki Miyake	Project Manager for REACH project
Carmela Centeno	Project Manager for Regional Projects
Gloria Adapon	Project Manager for Mae Hong Son Project
Jerome Stucki	Industrial Development Officer
Zhen Wang	Programme Officer, Asia and Pacific Programme
UNIDO REGIONAL OFFICE BANGKOK	
Edward Clarence-Smith	Head of the Office
Sooksiri Chamsuk	National Officer
Pornpoj Akkaravanich	Senior Secretary
Put Kamgoen	Programme Assistant
Jutamanee Martchamadol	National Project Coordinator for several GEF projects
Supalerk Kanasook	National Project Coordinator for Bioethanol project
Jintipaporn Saiprom	Project Assistant for Bioethanol project
Lindawan Phuangjumpee	Ministry of Industry Seconded professional
Uma Wirutskulchai	National Project Coordinator
Siwatt Pongpiachan	National Project Coordinator BAT/BEP Project
UNITED NATIONS THAILAND	
Martin Hart- Hansen	Deputy Resident Representative, UNDP
Luc Stevens	UN Resident Coordinator, UNDP Resident Representative
Nawarat Chalermphao	Assistant FAO Representative (Programme), Thai Affairs Division, Food and Agriculture Organization (FAO)
Liao Chongguang	Field Programme Officer, Operations, Emergency, Program Development, Food and Agriculture Organization (FAO)
Rosa Rolle	Senior Agro-Industry and Post-/harvest Officer, Food and Agriculture Organization (FAO)
INTERNATIONAL ORGANIZATION	
Suparat Udomkiattikul	Program Officer (Cooperation), Delegation of European Union
Suthiya Chantawarangkul	Program Officer (Switch Asia), Delegation of European Union

GOVERNMENT	
Udom Wongviwatchai	Deputy Permanent Secretary, Ministry of Industry
Supa Tangkittikhun	Director, Department of Industrial Promotion (DIP), Ministry of Industry
Worawit Jirattiticharoen	Department of Industrial Promotion (DIP), Ministry of Industry
Decha Pimpisut	Director, Public Participatory Promotion, Department of Industrial Works (DIW), Ministry of Industry
Sirakarn Leungsakul	Director, Air Pollution Division, Department of Industrial Works (DIW), Ministry of Industry
Siriruj Chulakaratana	Director General, Office of Industrial Economics, Ministry of Industry
Ni-On Sukhum	Plan and Policy Analyst, Office of Industrial Economics, Ministry of Industry
Sorawids Chailertwanitkul	Plan and Policy Analyst, Office of Industrial Economics, Ministry of Industry
Somboon Yindeeyoungyuen	Deputy Director General, Department of Primary Industries and Mines (DIPM), Ministry of Industry
Kittiphan Bangyikhan	Metallurgical Engineer, Department of Primary Industries and Mines (DIPM), Ministry of Industry
Jarin Cholpaisal	Department of Primary Industries and Mines (DIPM), Ministry of Industry
Decha Chatuthananant	Director, Policy and Strategy Bureau, Office of Permanent Secretary, Ministry of Industry
Wavaporn Watcharanon	Policy and Plan Analysis Officer, Policy and Strategy Bureau, Office of Permanent Secretary, Ministry of Industry
Lerttassanee Yuwattana	Policy and Plan Analysis Officer, Policy and Strategy Management Office, Ministry of Energy
Rawisara Riyaphan	Policy and Plan Analysis Officer, Policy and Strategy Management Office, Ministry of Energy
Chatchai Kunlohit	Head of Monitoring Policy Division, Ministry of Energy
Nilubon Luangchosiri	Policy and Strategy Development Office, Ministry of Energy
Thanin Pa-Em	Vice President, Office of National Economic and Social Development Board (NESDB)
Piyanit Onoparatvibool	Division Director, Industrial Sector Strategy Division, NESDB
Duangmanee Puakpol	Policy and Plan Analyst, Practitioner Level, Competitiveness Development Office, NESDB
Teeraporn Wiriwutikorn	Director of Hazardous Substance Division, Pollution Control Department, MNRE
Chalalai Rungruang	Environmental Office, Hazardous Substance Division, Pollution Control Department, MNRE
Chotika Chaichana	Chief of Policy and Planning Division, Mae Hong Son Provincial Industrial Office
Sasitorn Wongweerachotkit	Director of International Organizations Partnership Branch, Thailand International Development Cooperation Agency (TICA)
Grisada Phakakarn	Development Cooperation Officer, Thailand International Development Cooperation Agency (TICA)

Somsuan Howe	Senior Development Cooperation Officer, Thailand International Development Cooperation Agency (TICA)
INSTITUTE	
Suvit Tia	Associate Professor, Senior Vice President for Research, KMUTT
Warinthorn Sangkasiri	Senior Researcher, Laboratory Head, Excellent Centre of Waste Utilization and Management (EcoWaste), KMUTT
Annop Nopharatara	Researcher, Excellent Centre of Waste Utilization and Management (EcoWaste), KMUTT
Kanchana Saeangchan	Researcher, Excellent Centre of Waste Utilization and Management (EcoWaste), KMUTT
Terry Commins	Manager of ASEAN Centre for Conservation, Ecology and Biodiversity Research and Training, KMUTT
Juthamas Gomenthai	Expert, Textile Testing Centre, Thailand Textile Institute (THTI)
Yongvut Pirapatrungsuriya	President, National Food Institute (NFI)
Nitaya Pirapatrungsuriya	Vice-President, Department of Laboratory Services, National Food Institute (NFI)
Thepchao Sripoti	Specialist, Department of Research and Information, National Food Institute (NFI)
Warasaya Na Songkhla	Administrative Manager, Dept. of Business Performance Dev., Institute of Small and Medium Enterprises (ISMED)
Chothip Wisespongpan	Director, Dept. of Business Performance Dev., Institute of Small and Medium Enterprises (ISMED)
Narumol Ruenwai	Director, Knowledge Centre, The Thailand Institute of Scientific and Technological Research (TISTR)
Thippaya Junvee Fortune	Acting Director, Analytical Chemistry Laboratory, The Thailand Institute of Scientific and Technological Research (TISTR)
Varunee	Analytical Chemistry Laboratory, The Thailand Institute of Scientific and Technological Research (TISTR)
PRIVATE SECTOR	
Jumrud Sawangsamud	Director – General, The Federation of Thai Industry (FTI)
Panrat Petchpakdee	Director, The Industrial Environment Institute, FTI
Prarudee Donmok	Director, Human Resource Division, Tong Siang Co., Ltd.
Chakrit Jarrusbussarakam	Energy Manger, Tong Siang Co., Ltd.
Wasrika Tata	Energy Officer, Tong Siang Co., Ltd.
Thawutchai Donrasri	Energy Officer, Tong Siang Co., Ltd.
Thawutchai Donrasri	Energy Officer, Tong Siang Co., Ltd.
Maxim Willemse	Process Engineer, Dyecoo Textile Systems B.V.
Peera Klunklan	Chief of Boiler Division, Red Bull Co., Ltd.
Phatphinya Herlipaisarn	Plant Engineer, Red Bull Co., Ltd.
Kamol Tanpipat	Assistant Managing Director ,Bright Management Consulting Co. Ltd.
Soravit	Assistant Managing Director, Bright Management Consulting Co. Ltd.

Pakpoom Teranantana	Director, International Organizations Department, The Federation of Thai Industry (FTI)
Somyod Tangmeelarp	Vice Chairman, The Federation of Thai Industry (FTI)
Nopwarin Duangdee	Chief of Plant Engineer, Red Bull Co., Ltd.
COMMUNITY	
Ratree Krongchai	Chairman of Fermented Soybean Group, Pangmoo Village, Mae Hong Son Province
Sujit Wichaysakulwan	Secretary of Fermented Soybean Group, Pangmoo Village, Mae Hong Son Province
Kusol Supunyo	Head of Village Moo 2, Papu Village, Mae Hong Son Province
Boonyuen Supunyo	Chairman of Brown Sugar Group, Papu Village, Mae Hong Son Province
Champee Supunyo	Secretary of Brown Sugar Group, Papu Village, Mae Hong Son Province

Participant list: Presentation of preliminary findings – 2015-11-27 at UNIDO Thailand Office

Name	Designation, Organization Thailand
Worawit Jirattiticharoen	Department of Industrial Promotion (DIP), Ministry of Industry
Jutamaneer Martchamadol	National Project Coordinator for several GEF projects
Somyod Tangmeelarp	Vice Chairman, The Federation of Thai Industry (FTI)
Kanchana Saeangchan	Researcher, Excellent Center of Waste Utilization and Management (EcoWaste), KMUTT
Thippaya Junvee Fortune	Acting Director, Analytical Chemistry Laboratory, The Thailand Institute of Scientific and Technological Research (TISTR)
Thepchoo Sripoti	Expert, National Food Institute (NFI)
Pakpoom Teranantana	Director, International Organizations Department, The Federation of Thai Industry (FTI)
Uma Wirutskulshai	National Project Coordinator, UNIDO Thailand
Put Kamngoen	Programme Assistant
Sooksiri Chamsuk	National Officer
Somsuan Howe	Senior Development Cooperation Officer, Thailand International Development Cooperation Agency (TICA)
Sasitorn Wongweerachotkit	Director of International Organizations Partnership Branch, Thailand International Development Cooperation Agency (TICA)
Supalerk Kanasook	National Project Coordinator for Bioethanol project
Jintipaporn Saiprom	Project Assistant for Bioethanol project
Pornpoj Akkarnvanich	Senior Secretary, UNIDO Thailand
Suk-rutai Peerapong	Officer of the International Organizations Department, Federation of Thai Industry (FTI)
Kittiphan Bangyikhan	Metallurgical Engineer, Department of Primary Industries and Mines (DIPM), Ministry of Industry
Saiduangjai Pahuboonpong	Officer of the International Organizations Department, Federation of Thai Industry (FTI)

Javier Guarnizo	Senior Evaluation Officer, UNIDO
Brahmanand Mohanty	UNIDO Evaluation Expert

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UNIDO. *Project Document – Demonstration of BAT and BEP in fossil fuel-fired utilities and industrial boilers in response to the Stockholm Convention on POPs.* (January 2010)

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