



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



SUSTAINABLE DEVELOPMENT GOAL 9
INDUSTRY, INNOVATION AND INFRASTRUCTURE

Improvement of Industrial Energy Efficiency in Myanmar

GEF 5321

Mid-term Review
Preliminary Findings

By
San Shwe Aung
Stefan Melnitzky

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Project Objective

... aims to promote sustained GHG emissions reduction in the Myanmar industry by improving policy and regulatory frameworks and institutional capacity building for industrial EE (IEE) and the implementation of energy management systems, based on ISO 50001 and optimization of energy systems in industry

... are to result in improved regulations and financial incentive mechanisms, grant and non-grant instruments and strengthen technical and institutional capabilities for the development, financing and implementation of EnMS and EE improvements in various industries on a sustainable basis



Overview of Project Components and Outcomes

Component 1 – Improvement of policy and regulatory frameworks, incentive schemes, support programmes

- *Expected Outcomes:* Improved policy and regulatory frameworks, incentive schemes, support programmes, energy data and awareness to facilitate sustainable EE improvement in industry

Component 2 – Capacity Building

- *Expected Outcomes:* Strengthened or built capacity of institutions, industries, consultants and equipment suppliers on energy management system, energy system optimization and EE project financing to assist industries in the implementation of EE improvements

Component 3 – Demonstration and up-scaling

- *Expected Outcomes:* Demonstrated projects on energy management system, and energy system optimization in selected plants and sub-sectors and widely used case studies result in direct GHG emissions reductions and leverage the interest and belief in investment in IEE projects.

Component 4 – Monitoring and Evaluation



Objective of MTR

- Assess the project's performance and progress towards the achievement of the expected results
- Assess remaining barriers in project design, project management and performance of partners to identify the necessary changes to set the project on-track to achieve its expected results
- Develop recommendations and a follow-up plan on necessary corrective actions



Stakeholders consulted

- MOI and PMU at IEE training centre
- UNIDO Headquarter, National UNIDO team
- MOE, MONREC, MOEE, MES, MIA, UMFC CI
- National Experts and trainees,
International Experts (via skype)
- Companies and respective implementations
- Local vendors of products and services on IEE

Overall:

57 people, representing the main stakeholder and project beneficiaries





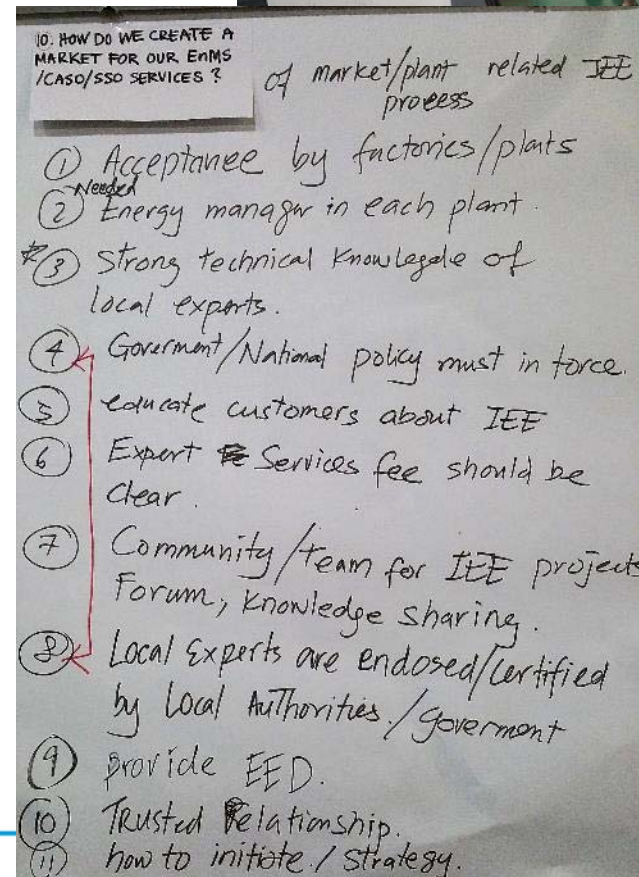
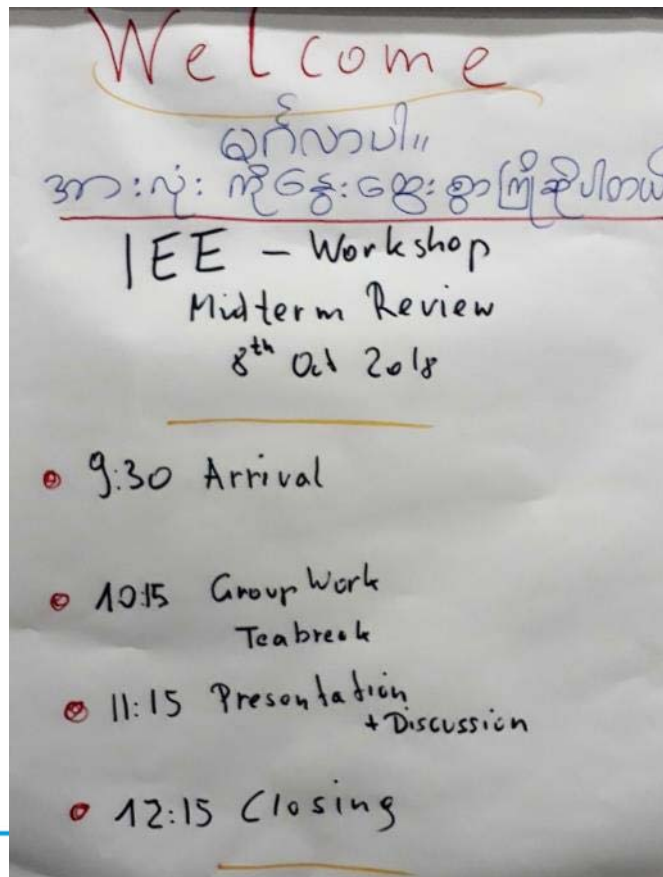
Technologies and Practices seen in the field

- Training center including compressor unit, metering & monitoring equipment
- Training material on CASO and SSO (English and Myanmar), for user and experts (hiring appropriate International experts)
- Trainees, experts, product and service vendors eager to work on SSO, CASO and EnMS
- Success stories and promotion material
- Increased compressor efficiency (metered savings up to 21%)
- Improved lighting systems (natural lighting, LEDs)
- EnMS (under preparation); improved metering & monitoring
- Assigned and committed company teams for IEE and EnMS





WS on 8th Oct with trained Expert 25 participants





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Key findings of the Mid-Term Review





Project Design and Relevance (I)

Project Design and Strategy

- Original design is highly relevant to the country context and to create awareness and capacity for IEE
- The project outputs and activities are in line with Myanmar Government priorities as well as with UNIDO's focus on SDG 8 and 9 and GEF strategies on GHG reduction
- Outcomes of project are already used to formulate EE&C act and ISO 50001
- Highly relevant for industries, though not fully recognized
- Project components and activities are well targeted, clear and consistent, but component on 'project sustainability strategy' is missing



Efficiency

Timeliness of Inputs/outputs

- Although the project is behind schedule, most of the objectives are likely to be met
- Further delays have to be avoided, especially for implementation and Case Study (success story) creation

Level of finance

- Around 60 % of funds still available, project funds are more than sufficient for remaining activities

Co – Financing

- from involved ministries, associations and UNIDO is significant, but not monitored in detail
- Investments from Industries are lagging behind



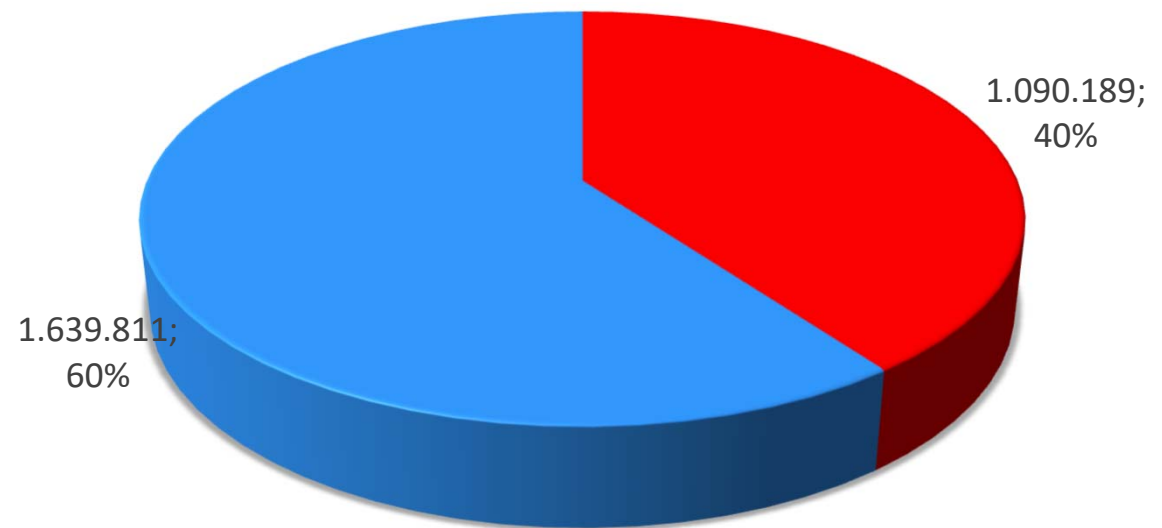
Project Budget

Overall Budget: 16,53 Mio USD

GEF Fund: 2,73 Mio USD

In Kind : 13,80 Mio USD

Status June 2018



From presentation at 4th PSC
given by Mr Than Oo

■ Disbursed ■ Remaining



Effectiveness of monitoring and evaluation systems

M&E design

- M&E design included the Project Results Framework, which includes OVIs at outcome level.
- Feasible indicators are provided for outputs, most of the targets provided are consistent with the activities described

M&E implementation

- Project has a functioning M&E system, all activities are monitored, minutes and attendance sheets available
- PSC meets (bi)annually and takes decisions as mandated



Status of Project Indicators

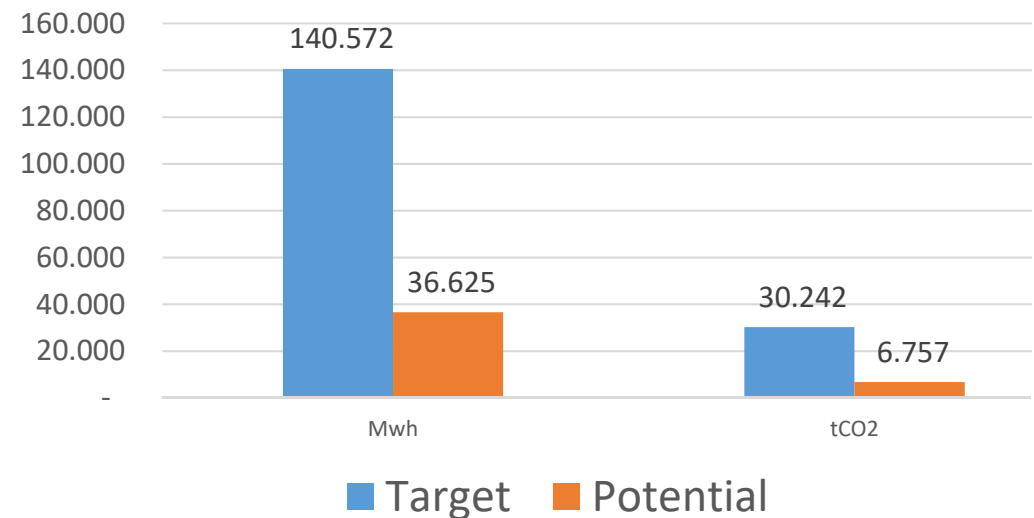
Number of trainings and awareness events is overachieved
Expert trained target is 40 and 39 ready to become certified

EnMS 50 / 10 target will be changed to 25
CASO/SSO 20 / 13 will be likely achieved in remaining period

Biggest gaps identified:

- Results for Energy saved and CO2 reduced
- finance training
- incentives schemes
- Databank delayed

From presentation at 4th PSC
given by Mr Than Oo





Sustainability (I)

Sustainability of Project outcomes

- Project structure and design – located at MOI with close cooperation with concerned ministries and associations will support the IEE activities after funded project period
- Upcoming Regulations and Standards will foster IEE in Myanmar and will increase the demand for trained IEE/EnMS experts (energy manager) and support market creation for IEE services
- Awareness creation and capacity building in industries by credible and easy to implement showcases is key to sustainability



Sustainability (II)

Main risks to sustainability

- Continuation of IEE training centre including measurement equipment and awareness activities after funded project period
- At present, companies are reluctant to pay for similar (metering and monitoring, assessments) services
 ‘Funded services’ versus Business Case
- Demand driven market for IEE will not increasing drastically with upcoming laws



Gender mainstreaming

- Some indicators include gender figures (ration of female participation). Numbers are monitored and targets will be met.
- Typical industrial sector have very limited female participation
- UNIDO revised gender policy not included as a part of project activities retrospectively



Lessons Learned (I)

- There was only very basic understanding on IEE in Myanmar, so project had to start from scratch
- Timeline was unrealistic as working with industries to understand IEE and energy management, to create awareness, to bring implementations to the ground may require longer gestation period
- Industries are hesitating to share data and therefore are not willing to display their success stories (case studies)
- Commitment starts with top management/company owner. Once committed, industries appreciate support from project and are willing to implement and can achieve significant savings



Lessons Learned (II)

- Involved stakeholders (ministries and associations) are willing to give even more support for remaining project period
- There are several opportunities upcoming to promote IEE (e.g. SME trade fairs, World Standard Day,...)
- Participating industries need more technical support to decide about investments/implementations for SSO/CASO
- Only very limited number of local available vendors for IEE products; no local standards on EE equipment



Lessons Learned (III)



Best practices

- Creation of multiple local showcases to prove viability and increase awareness, but limited visibility so far
- Combining awareness activities with capacity building
- Anchoring the project in respective ministries combined with support on policies, including close cooperation with National Standards & Quality department
- Enabling industries and Energy Manager to comply with upcoming laws, regulations and guidelines
- Local market demand creation (but still at low level) and capacitating experts and service providers



Summary

Project is very close to become a lighthouse project, but it needs some extra push / joint effort from all stakeholders in the remaining project period



Recommendations (I)

- The Project Logical Framework and Workplan should be reviewed and adapted to the actual situation especially focusing on the remaining time for project work
 - Specific focus could be on more direct support (handholding) for industries to foster implementation
 - Additional (in house) trainings on SO (CASO and SSO) could be offered to new companies, but also to officials from ministries (e.g. ECD staff)
 - Start training on project financing soon (2.1.3)
 - Fast implementation on IEE to create locally, credible success stories will increase even more interest
 - Additional resources for implementation on the ground and dissemination of best practices needed



Recommendations (II)

- Creation and publication of 'easy to copy' success stories will foster implementation in other companies
 - invite medium size companies to participate
- Success stories from SOE's will create even more awareness
 - Seek support from concerned Ministries to get SOE's on board (e.g. Fertilizer, LPG and Gas Turbine Plant)
- Focus on professional marketing of project results to create more awareness. Presentation at trade fairs, World Standard Day and others,... Utilize Social Media
 - Allocate additional resources for project marketing to increase visibility



Industrial Energy Efficiency Project

Myanmar

The Global Environment Facility (GEF) အသံကောင်းကောင်းနဲ့ အကောင်အထည်ဖော်ဆောင်ရွက်သည့် Improving Industrial Efficiency in Myanmar Project သည် စာရင်းပုံစံလုပ်ငန်းများ၏ Overall Energy Efficiency Improvement ရှိ မှန်ကန်စွာလုပ်ဆောင် ဆောင်ရွက်ထားသော Compressed Air System Optimization - CASO) ကို စိစစ်သော အသံကောင်းကောင်းနဲ့ အကောင်အထည်ဖော်ဆောင်ရွက်ခဲ့သော Proven Technology Industrial ဂျာနယ်သည် ကမ္ဘာ့သံကောင်းကောင်းနဲ့ အကောင်အထည်ဖော်ဆောင်ရွက်မှု(United Nations Industrial Development Organization - UNIDO) မှတ်တမ်းများ သက်သေခံရသော အသံကောင်းကောင်းနဲ့ အကောင်အထည်ဖော်ဆောင်ရွက်မှုဖြစ်သည်။

A Case Study of Proven Technology Industry Compressed Air System Optimization

Private Technology Industry Co., Ltd. (PTIC) သည် အဆင့်မြင့် ထုတ်ကုန်များ၊ အလုပ်သမား ပြင်ဆင်ပံ့ပိုးမှု၊ စက်ယန္တရားနှင့် အနက်မှ တစ်ခုဖြစ်သည့် အားလုံးကို ရောင်းချထားသည်။
ဘက်ထရီများ Standby ဘက်ထရီဖြင့် Sp. ၁၀၀၀၀၀ ဘက်ထရီများ ပါဝင်သည်။ ထုတ်ကုန်ပုံစံဆောင်များတွင် အားလုံးပါရှိသော အထည်ပေါ် ဆောင်ရွက်လျက်ရှိပါသည်။ ကျင့်သုံးလျက်ရှိသော System များမှာ ISO9000:2015(QMS)၊ ISO14001:2015(EMS)၊ OHSAS 18001:2007, Responsible Care နှင့် Total Quality Management စသည့် စနစ်များဖြစ်ပါသည်။

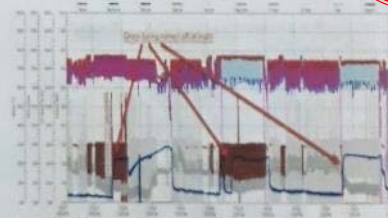


ပုံ(၁) International Expert မှ Datalogger အသုံးပြုမှု သင်ကြားခြင်း

ပူးပေါင်းပါဝင်ဆောင်ရွက်မှုနှင့် တွေ့ရှိချက်များ

PTIC ယှ အင်ဂျင်နီယာများနှင့် Management ကိုယ်စားလှယ်များသည် IEE Project ယှ ဖွင့်လှစ်ပို့ချခဲ့သော Energy Management System-EnMS သင်တန်း၊ Compressed Air System Optimization-CASO သင်တန်းများကို တက်ရောက်ခဲ့ပါသည်။ CASO သင်တန်းတွင် Compressed Air စွမ်းအင်သုံးစွဲခြင်း၊ စောင့်ရှောက်မှုအစီအစဉ်များ ပြုပြင်ထိန်းသိမ်းခြင်း၊ အစွမ်းအင်အသုံးချခြင်း အသုံးပြုခြင်း (Optimization) နည်းလမ်းများကို ပို့ချပါသည်။ ထို့ပြင် PTIC ကုမ္ပဏီသည် IEE Project နှင့် အပြည့်အဝပူးပေါင်း၍ International Expert အား စက်ရုံသို့ Factory Visit ပြုလုပ်ရန် ပေးခဲ့ပါသည်။ IEE Project ယှ အဆိုပြုသည့် Compressed Air Scoping Activity Training ကို လည်း လက်ခံဆောင်ရွက်ခဲ့ပါသည်။ စက်ရုံပါ Activities များတွင် International Expert ယှ စက်ရုံအင်ဂျင်နီယာများ၊ IEE

Project မှ အသုံးပြုသည့် အခြေခံသင်တန်းများကို Compressed Air System Assessment တစ်ခုအား မည်သို့ကိုင်ဆောင်နိုင်ရန်မကြည့်။ စာတွေလက်တွေ့ သင်ကြားပြီးမပေးပါ။ သင်တန်းများသည် CA System တစ်ခုတွင် ပါဝင်သော အစိတ်အပိုင်းများနှင့် သင်တန်း Characteristics များ အသုံးပြုမှုပုံစံ Data Loggers များနှင့် သင်တန်း မြေခုံမြေပုံ Software အသုံးပြုမှုပုံစံ System Block Diagram မြေခုံ System Pressures များ Demand Profile ၊ Compressor Control Strategy များပါ Loading ပြုလုပ်ခြင်း၊ Analysis ပြုလုပ်ခြင်း၊ စွမ်းဆောင်ရည်နှင့် ဖွဲ့စည်းပုံဆိုင်ရာများကို စာသုံးပုံစံများကို (သုံးရက်ကြာ စာတွေလက်တွေ့ သင်ကြားခြင်း)ပါဝင်ပြီး သင်တန်းပြီးဆုံးသည့် International Expert မှ ကျင့်သုံးမှုဆိုင်ရာ အကြံပြုချက်များအား ဆောင်ရွက်နိုင်သော Improvement မြှင့်တင်မှုများကို အသုံးပြုပုံစံ Saving ယူကတ် တွက်ချက်နိုင်ပြီးပြသသည့် CAAD Analysis Report ကို ပြုစု ထုတ်ပြန်ပေးပါသည်။



ပုံ(၂) ကော်ရို၏ CA System Pressure နှင့် Power Profile

CASO Scoping Study စော့ရှိုက်ချက်များနှင့် ဆောင်ရွက်ချက်များ

PTIC စက်ရုံများရှိ Compressed Air System များကို Data Logger များဖြင့် Assessment ပြုလုပ်ရာ အောက်ပါတို့ကို တွေ့ရှိခဲ့ပါသည်။

- Compressed Air Supply လိုလောက်မှု မရှိခြင်း
- Compressor များတွင် Pressure Setting များ သင့်လျော်မှုမရှိဘဲ မရှိခြင်း
- Air Dryer နှင့် Filter များတွင် Pressure Differential များနေခြင်း
- သိသာထင်ရှားသည့် လေယိုမိမှုဆုံးရှုံးမှုများ ရှိနေခြင်း
- လိုလောက်သည့်လေသွင်းအရွယ်အစား သုံးစွဲမှု မရှိခြင်း



Recommendations (III)

- Plan and work towards creating a self-sustaining model for the “*IEE Management and training Centre*”, as this will be core for long term IEE in Myanmar
 - This might include a network of EE experts (also product and service provider) to be utilized for promotion and experience exchange
 - Create a system to encourage use of existing measurement equipment to foster assessments and implementations
- Involved project partners should utilize upcoming PSC to come up with a joint decision how to modify the project to create more impact, especially regarding achievable GHG reduction
 - PMU to prepare revised workplan to be agreed upon by stakeholders in upcoming PSC in December
 - Request for project extension



IEE Myanmar Project

- Awareness creation in progress
- training conducted
trainees/experts eager to work
- Measurement equipment
Ready to use
- Assessments conducted
but only little response
- stakeholder engagement

Mismatch

Industries in Myanmar

- Low efficiency
- Need to increase IEE
- Existing/Upcoming laws and regulations
Environment and IEE
- Energy costs likely to increase
- IEE not seen as viable op.