



Project Implementation Report

(1 July 2022 – 30 June 2023)

Project Title:	<i>GHG Emissions Reductions in Targeted Industrial Sub-Sectors through EE and Application of Solar Thermal Systems in Malaysia</i>
GEF ID:	<i>4878</i>
UNIDO ID:	<i>120264</i>
GEF Replenishment Cycle:	<i>GEF-5</i>
Country(ies):	<i>MALAYSIA</i>
Region:	<i>SA - Southeast Asia</i>
GEF Focal Area:	<i>Climate Change Mitigation (CCM)</i>
Integrated Approach Pilot (IAP) Programs¹:	<i>none</i>
Stand-alone / Child Project:	<i>Stand-alone</i>
Implementing Department/Division:	<i>ENE / ESI</i>
Co-Implementing Agency:	<i>none</i>
Executing Agency(ies):	<i>SIRIM</i>
Project Type:	<i>Full-Sized Project (FSP)</i>
Project Duration:	<i>60 months</i>
Extension(s):	<i>3</i>
GEF Project Financing:	USD 4,000,000
Agency Fee:	USD 400,000
Co-financing Amount:	USD 20,000,000
Date of CEO Endorsement/Approval:	<i>4/24/2014</i>
UNIDO Approval Date:	<i>12/18/2014</i>
Actual Implementation Start:	<i>7/18/2014</i>
Cumulative disbursement as of 30 June 2023:	3,581,296.09 US

¹ Only for **GEF-6 projects**, if applicable

Mid-term Review (MTR) Date:	9/1/2018
Original Project Completion Date:	4/30/2020
Project Completion Date as reported in FY22:	6/30/2022
Current SAP Completion Date:	6/30/2022
Expected Project Completion Date:	6/30/2022
Expected Terminal Evaluation (TE) Date:	3/27/2023
Expected Financial Closure Date:	12/31/2023
UNIDO Project Manager ² :	Sanjaya Shrestha

I. Brief description of project and status overview

Project Objective
<p>To reduce GHG emissions in the country by promoting and demonstrating the energy efficiency improvements and solar thermal system application in the heating and cooling process in sector specific of Malaysian industries.</p> <p>The project "GHG Emissions Reductions in Targeted Industrial Sub-Sectors through EE and Application of Solar Thermal Systems in Malaysia" is promoted as Malaysian Energy Efficiency and Solar Thermal Application Project (MAEESTA).</p>

Baseline
<p>The high level of potential for thermal energy savings and solar thermal energy utilization in Malaysia's industry indicates the benefits associated with an initiative on solar thermal and energy efficiency in the industry. The potential in Malaysian industry lies in:</p> <ul style="list-style-type: none"> • The availability of good solar irradiation • The types of subsectors in Malaysia, in terms of numbers of companies, coincide with the subsectors whose processes have temperature levels into which solar thermal can be integrated into and; • Policies and incentives frameworks for renewable energy and energy efficiency, which have been put squarely on the map under the 10th Malaysia Plan and have been supported by policies, incentives, research and small demonstration projects. The market niche of thermal EE and solar thermal applications in the industry is limited in unleashing its potentials as it faces a number of gaps and barriers that are summarised in the project document proposal. <p>As regards government policy instruments for RE and EE, as well as the number of GEF projects, including MIEEIP and the on-going IEEMMS projects, the emphasis thus far has been mainly on electric energy, and much less on heat applications. For example, in the area of RE the emphasis has been on RE power generation; in solar energy, programmes have been implemented for solar PV. Apart from domestic solar water heaters, the government does not yet have policies, incentives or standards that specifically aim at larger-scale solar thermal system applications in commercial buildings or in industrial applications. Given the fact that electricity accounts for 33% of industrial energy demand, it makes sense to focus sustainable energy efforts on the 67% of fuel use for thermal applications.</p> <p>As a result of this minimal focus, fewer efforts have gone into energy management of heat in industrial processes and</p>

² Person responsible for report content

consequently less knowledge and awareness exist in this specific area. There is a similar lack of knowledge of linking such energy conservation efforts with the use of renewable energy, in this case solar for thermal heat applications.

The project will contribute to the government's commitment in achieving its target of a 40% greenhouse gas (GHG) reduction per GDP per capita by the year of 2020, as compared to 2005 levels.

Please refer to the explanatory note at the end of the document and select corresponding ratings for the current reporting period, i.e. FY23. Please also provide a short justification for the selected ratings for FY23.

In view of the GEF Secretariat's intent to start following the ability of projects to adopt the concept of adaptive management³, Agencies are expected to closely monitor changes that occur from year to year and demonstrate that they are not simply implementing plans but modifying them in response to developments and circumstances or understanding. In order to facilitate with this assessment, please introduce the ratings as reported in the previous reporting cycle, i.e. FY22, in the last column.

Overall Ratings ⁴	FY23	FY22
Global Environmental Objectives (GEOs) / Development Objectives (DOs) Rating	<i>Moderately Satisfactory (MS)</i>	<i>Moderately Satisfactory (MS)</i>
<i>The project is operationally completed and in the process of financial closure</i>		
Implementation Progress (IP) Rating	<i>Satisfactory (S)</i>	<i>Satisfactory (S)</i>
<i>The project is operationally completed and in the process of financial closure</i>		
Overall Risk Rating	<i>Low Risk (L)</i>	<i>Low Risk (L)</i>
<i>The project is operationally completed and in the process of financial closure</i>		

II. Targeted results and progress to-date

Please describe the progress made in achieving the outputs against key performance indicator's targets in the project's **M&E Plan/Log-Frame at the time of CEO Endorsement/Approval**. Please expand the table as needed.

Project ended on 30 June 2022. Terminal evaluation was completed accordingly and document attached.

Project Strategy	KPIs/Indicators	Baseline	Target level	Progress to-date
Component 1 – Development of regulatory framework, support programme and financial incentive mechanism to facilitate solar thermal energy utilization				
Outcome 1: Policy papers and financial incentive schemes established and endorsed by stakeholders				

³ Adaptive management in the context of an intentional approach to decision-making and adjustments in response to new available information, evidence gathered from monitoring, evaluation or research, and experience acquired from implementation, to ensure that the goals of the activity are being reached efficiently

⁴ Please refer to the explanatory note at the end of the document and assure that the indicated ratings correspond to the narrative of the report

Output 1.1: National counterparts supported to develop three policy papers on solar thermal energy.	Number of policy papers developed; % of counterparts taking part in the development of policy papers report having benefitted from built capacity; Number of workshops and seminars organized.	There are currently no policy papers on solar thermal energy under development.	At least 3 policy papers on solar thermal energy developed; At least 70% of counterparts taking part in the development of policy papers report having benefitted from built capacity; At least 5 workshops and seminars organized.	
Output 1.2:	Two financial incentive schemes focusing on solar thermal applications developed.	No financial incentive schemes for the specific purpose of promoting the utilization of solar thermal energy in industry are available.	At least 2 financial incentive schemes developed. At least 5 workshops and seminars/events to present and discuss proposals organized	
Component 2 – Awareness raising and capacity building program related to process heating and cooling optimization and solar thermal energy utilization				
Outcome 1: Awareness and capacity equipment vendors, service providers, industry management, plant engineers and financial institutions in 5 targeted industrial sub sectors strengthened and utilized.				
Output 2.1: Training programme in energy savings based on process heating and cooling conducted for service providers, consultants and industry in selected sub sectors	Numbers of trainees at various levels, users, experts, etc. trained in process heating optimization and waste heat recovery	No comprehensive trainings on process heating and cooling are available in the selected sub-sectors.	50 equipment vendors, 100 users and 50 experts trained.	
Output 2.2: Training programme on solar thermal technology conducted for equipment/component suppliers, service providers, consultants and industry in selected sub-sectors.	Number of trainees trained at various levels on solar thermal systems and integration in industrial processes.	No comprehensive trainings on solar thermal technology are available in the selected sub-sectors.	30 equipment vendors, 80 users and 40 experts trained	
Output 2.3: Awareness raising events organized for industry management and financial institutions on investment in energy savings and solar thermal application.	Number of awareness raising events organised; Number of publications issued; project website developed.	No comprehensive awareness programme on solar thermal energy utilization or on thermal EE in industry exists.	At least 20 awareness raising events for the target group (industry managers, financial institutions) organized, including experience with the demonstration projects; 20 publications, posters etc. issued; project website operational.	
Component 3 – Demonstration and scaling up of sector-specific EE and solar thermal energy utilization in targeted industrial subsectors				
Outcome 1: Thermal energy efficiency and solar thermal technology demonstrated and deployed in 5 targeted industrial sub-sectors.				
Output 3.1: Energy saving measures and investment projects	Number of facilities in which EE in thermal processes	No such demonstration projects are currently	40 companies with EE improvements in process heating and cooling;	

implemented in about 40 factories.	have been implemented.	available in the selected sub-sectors.		
Output 3.2: Of the above 40 factories, around 10 implemented solar thermal demonstration projects.	Number of facilities in which solar thermal energy utilized.	No such demonstration projects are currently available in the selected sub-sectors.	10 facilities with integrated solar thermal systems.	
Output 3.3: Case studies prepared and presented under output 2.3 to raise more investment in EE and solar thermal integration using the trained capacity and various financial incentive schemes created.	Number of case studies prepared and presented at awareness raising events; Number of future investment opportunities identified.	Due to the lack of demonstration projects and investment in solar thermal technologies in industry, case studies are nonexistent.	10 case studies prepared and presented at seminars/ workshops (total of 20 event days, held at workshops at various places throughout Malaysia);	

III. Project Risk Management

1. Please indicate the overall project-level risks and the related risk management measures: (i) as identified in the CEO Endorsement document, and (ii) progress to-date. Please expand the table as needed.

	(i) Risks	(i) Risk level	(i) Mitigation measures	(ii) Progress to-date
1	Management priorities in the participating public sector and private sector organizations change over time before and during project implementation	Low risk (L)	Signing of a Terms of Reference (ToR) and Cooperation Agreement with the Project partners before commencement of the project as well as co-financing letters.	
2	Effective coordination between various project partners.	Low risk (L)	A proper coordination will be sought through the Project Steering Committee and ad-hoc working groups per subsector or theme that can be set up as needed and by bringing in other partners and beneficiaries. The Project Management Unit (PMU) will play a key Role in the coordination of these interests and channelling them into the day to day execution of the project.	
3	Companies have doubts regarding techno-economic viability. Thus, demonstration projects are delayed, hence limiting the opportunity to disseminate success stories and to develop case studies.	Low risk (L)	To overcome this risk, the factories selected as demonstration sites will be carefully evaluated; this will include management support, financial strength, technical backup, and replication abilities. The demonstration project proponents are anticipated to provide initial case study results and thus serve as examples for other factories to replicate. While the GEF grant will support the demonstration projects in a number of ways (including up to 20% of equipment costs), all other costs will be borne by the participating companies, thus ensuring that continued participation is in the interest of their management.	
4	Limited number of Participants interested in training and no immediate	Low risk (L)	The integrated approach of the project is expected to mitigate this risk by not only promoting the technology but also creating a new market and demand for the	

	demand for services for trained experts as the growth of the market for solar thermal technology is slower than expected.		application in heat processes in the industrial and commercial sectors. The capacity building approach adopted by the project combined with awareness campaigns and policy coordination will ensure the sustainability of the project and thus development of the solar thermal technology market in Malaysia to mitigate this risk. The capacity of SERI and the FMM Institute will be strengthened by the project so that they will continue providing support to the local experts, industries, and the training.	
5	Incentives and the financial support system are insufficient	Low risk (L)	The capacity of financial and governmental institutions will be strengthened on energy saving opportunities and solar thermal systems and their potentials. Grant and non grant instruments will be developed and applied to ensure the availability of financing resources. Experiences from other countries will be shared, and results from the demonstration projects will be widely presented.	
6	Government financing and policy instruments for thermal energy application in industry is not effective enough to incentivize industrial stakeholders' investment in solar thermal technologies.	Low risk (L)	Chambers of Commerce and Industries, etc. will aim to mitigate this risk by designing or revising financing/policy instruments that are in line with the needs of industry. Focus will be given to provide adequate support to the industries for the implementation of solar thermal energy application: better technical support, awareness raising on the consequences of climate change, zero GHG emissions from solar energy, sufficient information on the availability of various financing schemes, etc	
7	Climate change risks: increased cloud cover from climate warming reducing solar radiation levels	Low risk (L)	Careful design of the solar thermal systems will be ensured during project implementation.	

2. If the project received a **sub-optimal risk rating (H, S)** in the previous reporting period, please state the **actions taken** since then to mitigate the relevant risks and improve the related risk rating. Please also elaborate on reasons that may have impeded any of the sub-optimal risk ratings from improving in the current reporting cycle; please indicate actions planned for the next reporting cycle to remediate this.

N/A.

3. Please indicate any implication of the **COVID-19** pandemic on the progress of the project.

N/A

4. Please clarify if the project is facing delays and is expected to request an **extension**.

N/A

5. Please provide the **main findings and recommendations of completed MTR**, and elaborate on any actions taken towards the recommendations included in the report.

N/A project closed

IV. Environmental and Social Safeguards (ESS)

1. As part of the requirements for **projects from GEF-6 onwards**, and based on the screening as per the UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), which category is the project?

- Category A project
- Category B project
- Category C project

(By selecting Category C, I confirm that the E&S risks of the project have not escalated to Category A or B).

Notes on new risks:

- *If new risks have been identified during implementation due to changes in, i.e. project design or context, these should also be listed in (ii) below.*
- *If these new/additional risks are related to Operational Safeguards # 2, 3, 5, 6, or 8, please consult with UNIDO GEF Coordination to discuss next steps.*
- *Please refer to the UNIDO [Environmental and Social Safeguards Policies and Procedures \(ESSPP\)](#) on how to report on E&S issues.*

Please expand the table as needed.

	E&S risk	Mitigation measures undertaken during the reporting period	Monitoring methods and procedures used in the reporting period
(i) Risks identified in ESMP at time of CEO Endorsement	N/A	N/A	N/A
(ii) New risks identified during project implementation (if not applicable, please insert 'NA' in each box)	N/A	N/A	N/A

V. Stakeholder Engagement

1. Using the previous reporting period as a basis, please provide information on **progress, challenges and outcomes** regarding engagement of stakeholders in the project (based on the Stakeholder Engagement Plan or equivalent document submitted at CEO Endorsement/Approval).

The project is operationally completed and in the process of financial closure.

2. Please provide any feedback submitted by national counterparts, GEF OFP, co-financiers, and other partners/stakeholders of the project (e.g. private sector, CSOs, NGOs, etc.).

3. Please provide any **relevant stakeholder consultation** documents.

VI. Gender Mainstreaming

1. Using the previous reporting period as a basis, please report on the **progress achieved on implementing gender-responsive measures and using gender-sensitive indicators**, as documented at CEO Endorsement/Approval (in the project results framework, gender action plan or equivalent),.

The project is operationally completed and in the process of financial closure

VII. Knowledge Management

1. Using the previous reporting period as a basis, please elaborate on any **knowledge management activities / products**, as documented at CEO Endorsement / Approval.

The project is operationally completed and in the process of financial closure

2. Please list any **relevant knowledge management mechanisms / tools** that the project has generated.

N/A

VIII. Implementation progress

1. Using the previous reporting period as a basis, please provide information on **progress, challenges and outcomes achieved/observed** with regards to project implementation.

The project is operationally completed and in the process of financial closure

2. Please briefly elaborate on any **minor amendments**⁵ to the approved project that may have been introduced during the implementation period or indicate as not applicable (NA).

Please tick each category for which a change has occurred and provide a description of the change in the related textbox. You may attach supporting documentation, as appropriate.

⁵ As described in Annex 9 of the *GEF Project and Program Cycle Policy Guidelines*, **minor amendments** are changes to the project design or implementation that do not have significant impact on the project objectives or scope, or an increase of the GEF project financing up to 5%.

<input type="checkbox"/>	Results Framework	
<input type="checkbox"/>	Components and Cost	
<input type="checkbox"/>	Institutional and Implementation Arrangements	
<input type="checkbox"/>	Financial Management	
<input type="checkbox"/>	Implementation Schedule	
<input type="checkbox"/>	Executing Entity	
<input type="checkbox"/>	Executing Entity Category	
<input type="checkbox"/>	Minor Project Objective Change	
<input type="checkbox"/>	Safeguards	
<input type="checkbox"/>	Risk Analysis	
<input type="checkbox"/>	Increase of GEF Project Financing Up to 5%	
<input type="checkbox"/>	Co-Financing	
<input type="checkbox"/>	Location of Project Activities	
<input type="checkbox"/>	Others	

3. Please provide progress related to the **financial implementation** of the project.

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IX. Work Plan and Budget

1. Please provide **an updated project work plan and budget** for the remaining duration of the project, as per last approved project extension. Please expand/modify the table as needed.

N/A as project is operationally closed

Outputs by Project Component	Year 1				Year 2				Year 3				GEF Grant Budget Available (US\$)
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Component 1 –													
Outcome 1:													
Output 1.1:													
Output 1.2:													
Component 2 –													
Outcome 2:													
Output 2.1:													
Output 2.2:													

X. Synergies

1. **Synergies** achieved:

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3. **Stories to be shared** (Optional)

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XI. GEO LOCATION INFORMATION

The Location Name, Latitude and Longitude are required fields insofar as an Agency chooses to enter a project location under the set format. The Geo Name ID is required in instances where the location is not exact, such as in the case of a city, as opposed to the exact site of a physical infrastructure. The Location & Activity Description fields are optional. Project longitude and latitude must follow the Decimal Degrees WGS84 format and Agencies are encouraged to use at least four decimal points for greater accuracy. Users may add as many locations as appropriate.

Web mapping applications such as [OpenStreetMap](#) or [GeoNames](#) use this format. Consider using a conversion tool as needed, such as: <https://coordinates-converter.com>

Please see the Geocoding User Guide by clicking [here](#)

Location Name	Latitude	Longitude	Geo Name ID	Location and Activity Description

Please provide any further geo-referenced information and map where the project interventions is taking place as appropriate.

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EXPLANATORY NOTE

1. **Timing & duration:** Each report covers a twelve-month period, i.e. 1 July 2022 – 30 June 2023.
2. **Responsibility:** The responsibility for preparing the report lies with the project manager in consultation with the Division Chief and Director.
3. **Evaluation:** For the report to be used effectively as a tool for annual self-evaluation, project counterparts need to be fully involved. The (main) counterpart can provide any additional information considered essential, including a simple rating of project progress.
4. **Results-based management:** The annual project/programme progress reports are required by the RBM programme component focal points to obtain information on outcomes observed.

Global Environmental Objectives (GEOs) / Development Objectives (DOs) ratings	
Highly Satisfactory (HS)	Project is expected to achieve or exceed <u>all</u> its major global environmental objectives, and yield substantial global environmental benefits, without major shortcomings. The project can be presented as “good practice”.
Satisfactory (S)	Project is expected to <u>achieve most</u> of its <u>major</u> global environmental objectives, and yields satisfactory global environmental benefits, with only minor shortcomings.
Moderately Satisfactory (MS)	Project is expected to <u>achieve most</u> of its major <u>relevant</u> objectives but with either significant shortcomings or modes overall relevance. Project is expected not to achieve some of its major global environmental objectives or yield some of the expected global environmental benefits.
Moderately Unsatisfactory (MU)	Project is expected to achieve <u>some</u> of its major global environmental objectives with major shortcomings or is expected to <u>achieve only some</u> of its major global environmental objectives.
Unsatisfactory (U)	Project is expected <u>not</u> to achieve <u>most</u> of its major global environmental objectives or to yield any satisfactory global environmental benefits.
Highly Unsatisfactory (HU)	The project has failed to achieve, and is not expected to achieve, <u>any</u> of its major global environmental objectives with no worthwhile benefits.

Implementation Progress (IP)	
Highly Satisfactory (HS)	Implementation of <u>all</u> components is in substantial compliance with the original/formally revised implementation plan for the project. The project can be presented as “good practice”.
Satisfactory (S)	Implementation of <u>most</u> components is in substantial compliance with the original/formally revised plan except for only few that are subject to remedial action.
Moderately Satisfactory (MS)	Implementation of <u>some</u> components is in substantial compliance with the original/formally revised plan with some components requiring remedial action.
Moderately Unsatisfactory (MU)	Implementation of <u>some</u> components is <u>not</u> in substantial compliance with the original/formally revised plan with most components requiring remedial action.
Unsatisfactory (U)	Implementation of <u>most</u> components in <u>not</u> in substantial compliance with the original/formally revised plan.
Highly Unsatisfactory (HU)	Implementation of <u>none</u> of the components is in substantial compliance with the original/formally revised plan.

Risk ratings	
Risk ratings will assess the overall risk of factors internal or external to the project which may affect implementation or prospects for achieving project objectives. Risk of projects should be rated on the following scale:	
High Risk (H)	There is a probability of greater than 75% that assumptions may fail to hold or materialize, and/or the project may face high risks.
Substantial Risk (S)	There is a probability of between 51% and 75% that assumptions may fail to hold or materialize, and/or the project may face substantial risks.
Moderate Risk (M)	There is a probability of between 26% and 50% that assumptions may fail to hold or materialize, and/or the project may face only moderate risk.
Low Risk (L)	There is a probability of up to 25% that assumptions may fail to hold or materialize, and/or the project may face only low risks.