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Sustainable Energy Initiative for Industries in Pakistan

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<sup>1</sup> In 2018 and 2019 Carlos Chanduvi was preparing/signing the PIRs

## Glossary of evaluation-related terms

Term	Definition
Results-Based Management (RBM)	A management strategy focusing on performance and achievement of outputs, outcomes, and impacts.
Monitoring	A continuing function that uses systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing development intervention with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds.
Review	An assessment of the performance of an intervention, periodically or on an ad hoc basis. Note: Frequently “evaluation” is used for a more comprehensive and/or more in-depth assessment than “review”. Reviews tend to emphasize operational aspects. Sometimes the terms “review” and “evaluation” are used as synonyms.
External evaluation/review	The evaluation/review of a development intervention conducted by entities and/or individuals outside the donor and implementing organizations.
Formative evaluation/review	Evaluation/review intended to improve performance, most often conducted during the implementation phase of projects or programs.
Relevance	The extent to which the objectives of a development intervention are consistent with beneficiaries’ requirements, country needs, global priorities, and partners’ and donors’ policies. Note: Retrospectively, the question of relevance often becomes a question as to whether the objectives of an intervention or its design are still appropriate given changed circumstances.
Effectiveness	The extent to which the development intervention’s objectives were achieved, or are expected to be achieved, taking into account their relative importance.
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.
Sustainability	The continuation of benefits from a development intervention after significant development assistance has been completed. The probability of continued long-term benefits. The resilience to risk of the net benefit flows over time.
Institutional development impact	The extent to which an intervention improves or weakens the ability of a country or region to make more efficient, equitable, and sustainable use of its human, financial, and natural resources, for example through: (a) better definition, stability, transparency, enforceability and predictability of institutional arrangements

Term	Definition
	and/or (b) better alignment of the mission and capacity of an organization with its mandate, which derives from these institutional arrangements. Such impacts can include intended and unintended effects of an action.
Logframe or Project Result framework	A management tool used to improve the design of interventions, most often at the project level. It involves identifying strategic elements (inputs, outputs, outcomes, impact) and their causal relationships, indicators, and the assumptions or risks that may influence success and failure. It thus facilitates planning, execution, monitoring and evaluation of a development intervention.
Results	The output, outcome or impact (intended or unintended, positive and/or negative) of a development intervention.
Impacts	Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.
Outcome	The likely or achieved short-term and medium-term effects of an intervention's outputs.
Outputs	The products, capital goods and services that result from a development intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes.
Indicator	Quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor. Means by which a change will be measured. Example: Total wastewater in t/yr.
Target	Definite ends to be achieved. Specifies a particular value that an indicator should reach by a specific date in the future. Example: Reduce by 50% the amount of wastewater in t/yr, between 2015 and 2020.
Milestones	Interim targets; points in the lifetime of a project by which certain progress should have been made. They provide an early warning system and are the basis for monitoring the trajectory of change during the lifetime of the project.
Baseline	The situation before a development intervention against which progress can be assessed or comparisons made.
Assumptions	Hypotheses about factors or risks which could affect the progress or success of a development intervention.

<b>Term</b>	<b>Definition</b>
	Necessary conditions for the achievement of results at different levels. These are conditions that must exist if the project is to succeed but which are outside the direct control of the project management. This is called the external logic of the project because these conditions lie outside the project's accountability and can be related to laws, political commitments, political situations, financing, etc.
Theory of change	Theory of change or programme theory is similar to a logic model, but includes key assumptions behind the causal relationships and sometimes the major factors (internal and external to the intervention) likely to influence the outcomes.
Conclusions	Conclusions point out the factors of success and failure of the evaluated intervention, with special attention paid to the intended and unintended results and impacts, and more generally to any other strength or weakness. A conclusion draws on data collection and analyses undertaken through a transparent chain of arguments.
Lessons learned	Generalizations based on evaluation experiences with projects, programs, or policies that abstract from the specific circumstances to broader situations. Frequently, lessons highlight strengths or weaknesses in preparation, design, and implementation that affect performance, outcome, and impact.
Recommendations	Proposals aimed at enhancing the effectiveness, quality, or efficiency of a development intervention; at redesigning the objectives; and/or at the reallocation of resources. Recommendations should be linked to conclusions.
Gender mainstreaming	The process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetuated. The ultimate goal is to achieve gender equality

## Abbreviations and acronyms

Acronym	Meaning
AEDB	Alternative Energy Development Board
BAT	Best Available Technologies
DISCO	Power Distribution Company
EE	Energy Efficient
ENERCON	National Energy Conservation Centre (renamed to NEECA)
EnMS	Energy Management Scheme
EV	Electric Vehicle
GEF	Global Environment Facility
GENCO	Power Generation Company
GHG	Greenhouse Gases
MOCC	Ministry of Climate Change
MOF	Ministry of Finance, Revenue, Planning, and Development
MoIP	Ministry of Industry and Production
MoPNR	Ministry of Petroleum and Natural Resources
MoWP	Ministry of Water and Power
NEPRA	National Power Regulatory Agency
NEECA	National Energy Efficiency and Conservation Authority (former ENERCON)
NPC	National Project Coordinator
NPO	National Productivity Organization
NRSP	National Rural Support Programmes
PCGC	Pakistan Credit Guarantee Company
PCRET	Pakistan Council of Renew Energy Technologies
PFP	Project Focal Point
PLF	Project Logical Framework or Log frame
PMU	Project Management Unit
PSQCA	Pakistan Standards and Quality Control Authority
PSC	Project Steering Committee
RE	Renewable Energy



<b>Acronym</b>	<b>Meaning</b>
REAP	Renewable Energy Association of Pakistan
REEE	Sustainable Energy Initiative for Industries in Pakistan
RCCI	Rawalpindi Chamber of Commerce and Industry
SEI <sup>2</sup>	Sustainable Energy Initiative for Industries in Pakistan
SEC	Specific Energy Consumption
SMEDA	Small and Medium Enterprise Development Authority
TE	Terminal Evaluation
ToC	Theory of Change
TOE	Tons of Oil Equivalent
TOR	Terms of Reference
ToT	Training of Trainers
UNIDO	United Nations Industrial Development Organization

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<sup>2</sup> In some documents this short form is used for UNIDO GEF project

## Executive summary

This independent Terminal Evaluation (TE) covered the whole duration of the “Sustainable Energy Initiative for Industries in Pakistan (REEE)” project from its starting date in June 2014 to its completion in December 2022. Overall performance was reviewed against the standard evaluation criteria of relevance, coherence, efficiency, effectiveness, progress to impact, and sustainability. In addition to assessing overall results, the evaluation also aimed to identify recommendations to inform and strengthen UNIDO’s future interventions.

The REEE project aimed to reduce energy-related greenhouse gas emissions by facilitating the creation of a market environment to promote the use of Renewable Energy and Energy Efficiency (RE&EE) technologies and measures in the selected industrial sectors of Pakistan.

The REEE sought to address barriers related to the policy, incentives for the development of a robust domestic market for delivering technology and management solutions, and an enhanced policy and regulatory framework for promotion of RE&EE measures in the industry. The project adopted an integrated and holistic approach that combined demonstration projects with high replication potential with interventions seeking to establish a market environment conducive to investments in clean energy practices and technologies. REEE was initially planned for four years, but was extended two times, and finally lasted 7.5 years.

The project was well designed and the strategies to promote Energy Efficiency (EE), Renewable Energy (RE), and Energy Management Schemes (EnMS) to reduce Green House Gas (GHG) emissions are still valid and highly needed. Project extension worked in favour of the project, as its results came in timely to support plans from various ministries and to aid industries during an actual energy crisis.

In order for the project to be successful, an approach was adopted that combined interventions at both policy and institutional level to enable a shift towards improved EE and the use of RE. The Alternative Energy Development Board (AEDB), National Energy Efficiency and Conservation Authority (NEECA), National Productivity Organization (NPO), and Small and Medium Enterprise Development Authority (SMEDA) were the main public executing partners of the project. The holistic approach and the high number of training, technical meetings and expert discussions created **a strong national ownership of the project results** and led to advance knowledge and awareness of RE&EE among all relevant stakeholders.

The project’s **Progress to Impact** is highly satisfactory as REEE met or exceeded its objectives and contributed already to the overall Project Objective “...to reduce energy-related GHG emissions...” with a target number of a “...cumulative reduction of about **2 million tCO<sub>2</sub> over the lifetime** of the investments linked with the project in various technologies...”.

The project has almost achieved its direct emissions reduction targets (**1.78 Mio tCO<sub>2</sub>e out of 2 Mio**) and has contributed to reducing much more emissions indirectly, by developing new business models. For example, net metering and Power Purchase Contracts (PPA)) have become a common practice in Pakistan and demonstrate the business case of RE&EE investment. It has demonstrated the technical viability and commercial potential of RE&EE technologies and business models and has supported important policy developments. **The main project objective to “...create a market...” has been already achieved.** Beyond these immediate results, REEE has also laid a solid foundation for further impact. The extensive project outputs – policy recommendations, baseline study, technical guidance, best practice examples, attractive new business models, energy desk, etc. – are significant in themselves. Another asset for the successful implementation of RE&EE in the future in Pakistan is the huge number of well-trained and highly committed Energy Experts trained by the project.

**Relevance and Design:** The original project design was and still is highly relevant to the country context. Most of the project outputs and activities were in line with Pakistan Government priorities as well as with UNIDO’s and GEF’s focus on Sustainable Development Goals (SDG) 9

and 7 and GHG reduction. The design fitted the actual needs of the country in 2013 when the project was formulated, but had to be adapted to actual needs.

The project was relevant to the target group and project stakeholders. The multi-stakeholder approach and the high number of workshops, technical meetings, and experts' discussions created a strong sense of ownership of the project results among the national stakeholders.

**Coherence** is high as the REEE project was within national political and legislative structures and was highly complementary to other work being delivered in Pakistan. The support of both UNIDO and GEF – and the associated necessity of having cross-ministry involvement from both MOIP and MOCC – and the relevant national and sub-national level authorities gave REEE a higher profile within Pakistan.

**Project efficiency is satisfactory**, despite the extensions. The project was largely efficient with all major outcomes achieved (or even overachieved) within the given budget. At the time of the TE mission around 98.5% of project funds - i.e. USD **3,500,783** - was spent<sup>3</sup>, the 1.5% was planned to be utilized for remaining activities (i.e. closing and promotion event). UNIDO project management team in Pakistan (with support from headquarter) appropriately reported financial information. Changes to fund allocations as a result of actual planning and budget revisions took place, and had been jointly agreed upon, documented properly, and were appropriate.

Co-financing from industries, National Rural Support Programmes (NRSP) and Shams Power were significant. The monitoring scheme for co-financing was done in great detail and jointly agreed upon between the main stakeholders. The latest figures showed the **total co-financing of USD 20.54 Million**, most of it (20.47 Mio USD) was cash and came from the 56 units that received direct support from the project. These figures showcase the viability of EE activities and Photovoltaic Systems investment in Pakistan.

**Project effectiveness is rated satisfactory**; most output targets were achieved or exceeded, and substantial progress towards most outcomes has already become visible. Two components did not materialize due to changed frame conditions and resources planned for those activities were efficiently redirected to other project components at an early stage. The outcomes of REEE lead to direct annual savings of **7,169 tCO<sub>2</sub>e from PV plants** leading to lifetime savings (i.e. 20 years) of **143,380 tCO<sub>2</sub>e**. The annual savings from EE are **163,238 tCO<sub>2</sub>e**, with the assumption that the average lifetime of EE savings is around 10 years this will lead to a lifetime savings of 1,635,000 tCO<sub>2</sub>e; **overall resulting in a reduction of 1.78 Mio tCO<sub>2</sub>e**.

The **project sustainability is rated highly satisfactory**; RE&EE is seen as a business opportunity in Pakistani industries, among consultancies and service providers. The payback period for most RE/EE investments is very attractive, and upscaling has already started. A 'market' has been created and major project partners have secured funds for the continuation of activities.

At present, with the existing price structure for gas, diesel, and electricity **only low risks are visible**. RE&EE investments have become a highly viable option with an attractive return on investment. The main risk is limited access to finance. Currently the lack of financing opportunities, grant schemes, and subsidies are visible and these are the major problems, especially for smaller industries with limited resources.

The rating of the key evaluation criteria is summarized in the table below.

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<sup>3</sup> Source: UNIDO database, from 3<sup>rd</sup> September 2022

## Rating table

#	Evaluation criteria	Definition	Rating
<b>A</b>	<b>Progress to impact</b>	As the first of its kind project in Pakistan, it could create a massive positive impact regarding awareness on EE and RE. REEE has created a “market environment to promote the use of EE&RE” and has contributed significantly – and is likely to contribute more in the future - to GHG reduction.	<b>6</b>
<b>B</b>	<b>Project design</b>		
1	Overall design	Well-defined and appropriate design, as evident through the clear and detailed project document. Design fitted to the actual needs of the country in 2013, but had to be adapted to the actual needs	5
2	Logframe	Clear LF, with the appropriate number of indicators and fitted to the needs at the design stage, but never adapted to actual needs.	5
<b>C</b>	<b>Project performance</b>		
1	Relevance	Highly relevant to national priorities, to the work of UNIDO and the GEF, and to key beneficiaries. Much needed to create awareness and promote EE and RE in the country.	5
2	Coherence	The project was extremely well-embedded within national political and legislative structures and has been contributing to future policies and supporting the private sector toward GHG reduction	5
3	Effectiveness	Most output targets achieved or exceeded, substantial progress towards most outcomes. Two main components did not materialize (due to changed frame conditions), consequently, resources planned for those activities were efficiently and successfully redirected to other project components at an early stage.	5
4	Efficiency	Largely efficient, secured finance missing funds from the public sector; an impressive volume of co-financing from the private sector secured, but needed several extensions.	5
5	Sustainability of benefits	Project structure and design are already supporting RE and EE measures after project completion. Industries have understood the business case of RE&EE and will continue to implement it after the project end. Major project partners have secured funds for the continuation of activities. A ‘market’ has been created.	6
<b>D</b>	<b>Cross-cutting performance criteria</b>		
1	Gender mainstreaming	Specific programs to foster female EE experts; Project has done extremely well to advanced gender equality in the energy sector. REEE introduced successfully the “Award for the Best female professional in the Energy sector” and supported women’s standing in industries.	5

#	Evaluation criteria	Definition	Rating
2	M&E design	M&E design including the PLF with indicators at the outcome level and M&E system was done well, but never adapted to the amended project plans. Feasible indicators are provided for all originally planned outputs.	5
3	M & E implementation	The project had a functioning M&E system, all activities were monitored accordingly, and minutes and attendance sheets were available, but indicators were never adapted to the amended project plans; the Mid-term review was conducted as planned. Calculations for CO <sub>2</sub> /GHG reductions were reasonable and traceable.	5
4	Results-based management (RBM)	Project Progress updates and Action Plans were used for planning and corrective actions and support decision-making.	5
<b>E</b>	<b>Performance of partners</b>		
1	UNIDO	Well-regarded by National Counterparts, providing valued technical inputs in a timely manner. UNIDO reputation-supported implementations in industries.	6
2	National counterparts	Government stakeholders played a role in the project decision-making and supported project implementation, funds from the public sector did not materialize.	5
3	Donor	Limited inputs, but highly visible support during the project's initial stages and funds provided on schedule.	6
<b>F</b>	<b>Overall assessment</b>		<b>5</b>

## Conclusion

The REEE project was consistent with GEF-5 Climate Change Focal Area Objectives 2 and 3 aiming at promoting market transformation for energy efficiency in industry and the building sector and promoting investments in renewable energy technologies. It promoted the introduction of Energy Management Schemes (EnMS), System Optimization (SO<sup>4</sup>), and selected renewable energy (RE) technologies in the industry in Pakistan. This was in line with the priority of the government of Pakistan to reduce GHG emissions and explore the possibilities of alternate sources of energy.

The **project was a catalyst for the widespread replication of EE and RE initiatives** by the government and private sector through three main project components. UNIDO in pursuit of its goal to support the industry with innovative technologies evolved its strategy successfully from selecting a few bigger RE companies (considered as demonstration projects) to a relatively large number of beneficiaries with a mix of small and medium enterprises. This change of strategy resulted from the fact that all initially selected large projects backed off from their commitments, either due to financial constraints, a change in priority of the management, or the change in management itself, or some projects became unfeasible and/or unviable due to fluctuating energy prices and bottlenecks in the availability of energy sources, as in the case of biomass projects.

<sup>4</sup> Endorsement document used the term System Optimization, during project execution the term Energy Efficiency was used for these activities

The project experienced severe delays in the start-up phase and two extensions were needed, one of them was due to Covid lockdowns. These extensions worked in favour of the project and **all results came well in time to feed into policy papers and to support industries during an actual energy crisis**. Project outcomes have been utilized to prepare the “Alternative Resources for Energy (ARE) Policy 2019” and the “National Energy Efficiency and Conservation EE&C”, 5 Year Action Plan. Multiple best practices could be identified and would have a positive impact on future work in the field of EE and RE.

Overall, **a supportive climate for the adaptation of Renewable energy and Energy efficiency measures in Pakistan has emerged** and many stakeholders of REEE are showing high interest in supporting the project activities<sup>5</sup>.

Based on detailed feedback from project stakeholders and the evaluation’s findings, the following recommendations are made, to inform the design and strengthening of future UNIDO initiatives.

**Recommendations:**

1. UNIDO should take care to include informational and awareness-raising activities in future projects, to illustrate best practices and success stories on RE and EE.
2. It is recommended that UNIDO include a communication strategy in its future projects on EE and RE in order to enhance upscaling and replication efforts.

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<sup>5</sup> When this report was prepared it was not clear whether GEF 7 successor project can be realized, but all stakeholder supported it

## I. Overview of the project

### 1. Country and project background and context

The government of Pakistan, when updating its nationally determined contributions (NDCs), committed to reducing GHG emissions by up to 50% from the business-as-usual (BAU) level by 2030, in comparison with its previous target of 20% in 2016. To reach the new goal, Pakistan aimed at 60% of the electricity in the country to be generated from renewable sources like solar, wind, and hydropower by 2030. The ambition was revealed after Pakistan was ranked as the eighth most vulnerable country to extreme weather events out of 180, according to “non-profit Germanwatch”.

According to the government's BAU scenario, Pakistan's emissions will grow from 405 million metric tons of CO<sub>2</sub> in 2016 to 1.6 billion tons in 2030. So, a 50% cut from the BAU level in 2030 will still lead to much higher emissions in absolute terms.

On the other hand, the power situation in Pakistan is characterized by an increasingly widening gap between demand and supply. In fact, the power situation in Pakistan has of late been described as reaching crisis level with a recognition that no quick solutions are possible. The order of magnitude of unmet demand in peak months is over 25% of peak demand and keeps rising. This situation adversely affects the economy and the general well-being in Pakistan. The lack of sufficient power is compounded by the high transmission losses of around 30%, including technical (poor quality infrastructure) and non-technical (theft and non-payment due to poor bill collection) losses as well as the problem of ‘circular debt’.

Many companies have difficulties in accessing modern energy services due to the frequent electricity supply interruption in the country. This, in particular, affects the small and medium-sized enterprises (SMEs) that often have to resort to the use of expensive diesel generator sets. The power shortage and interruptions result in lowering of the industries’ production, profit, capacity, and opportunity to grow. The Government of Pakistan has launched various initiatives with the aim of promoting energy efficiency and the use of alternative and renewable energy in the country. These initiatives have achieved varied results so far.

Pakistan’s Initial National Communication (INC) on Climate Change names the five significant greenhouse gas (GHG) sources as energy; industrial processes; livestock and agriculture, forestry, and land use; and waste sector. The energy, industrial processes and forestry and land use change sectors contribute 81%, 12% and 7% of total CO<sub>2</sub> emissions, respectively.

Although industry contributes only 12% to CO<sub>2</sub> emissions in the country, there is growing recognition that as the economy of the country continues to shift towards a more industrialised status, there will be increased industrial activities and hence increase in GHG emissions if the power generation status is not changed.

In 2019, as one of the CO<sub>2</sub> reduction initiatives, the Prime Minister’s Committee on Climate Change approved the minimum mandatory electric vehicle (EV) penetration targets and tasked the Ministry of Climate Change<sup>6</sup>(MoCC) to develop the National Electric Vehicle Policy which was finally approved by the Cabinet in its meeting on November 5, 2019. This initiative reflects net benefits in the range of US\$ 2.2 billion to US\$ 3.7 billion as net saving in oil bills to the country under different scenarios in the 2020-2030 period. Additionally, there are benefits on account of job opportunities to a number of 35000-40000, reduction in emissions and air pollution/smog; associated health benefits; and the larger economic benefits of establishment of local manufacturing facilities. This is a flagship initiative of Government of Pakistan to address climate change aligned 30% of Electric Vehicles to be on road by 2030.

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<sup>6</sup> YEAR-BOOK-2020-2021 -

<https://www.mocc.gov.pk/PublicationDetail/MGFjN2UzZDMtNTEzOS00Zjk5LWFjNDQ0tNGRkOWRkZmM1Zjdk>

Initiatives to promote EVs make only sense if electricity supply comes from renewable sources; therefore, this strategy will support REEE objectives and will contribute to sustainability of project outcomes.

The project “Sustainable Energy Initiative for Industries in Pakistan”, also known as the Renewable Energy and Energy Efficiency (REEE) Project, was funded by Global Environment Facility (GEF). It was implemented by UNIDO between 2015 and 2022, with the aim to avoid greenhouse gas (GHG) emissions by developing and promoting a market environment that would stimulate investments in renewable energy and energy efficiency in industries which, in turn, would help drive economic growth, and support industrial development in Pakistan.

UNIDO collaborated with the Ministry of Climate Change (MoCC) along with government institutions including SMEDA, NPO, NEECA, AEDB, and achieved many successes. The project worked in synchronization with both the primary target groups which were the institutions mandated for the development of the REEE, including government policy-making and implementing institutions and with primary project beneficiaries such as industries, energy consultants, professionals, suppliers, and academia.

## 2. Project Objectives

The REEE project aimed to reduce energy-related greenhouse gas emissions by facilitating the creation of a market environment to promote the use of RE&EE technologies and measures in the selected industrial sectors of Pakistan.

The Project Management Unit (PMU) was set up by UNIDO being the GEF implementing agency and the project partner NPO to ensure adequate organizational structure and systems for facilitating implementation. The physical location for the PMU office was at UNIDO’s premises in Islamabad.

REEE was supported by US\$ 3.55m from the Global Environment Facility (GEF), with the project proposal indicating that REEE counterparts and beneficiaries would provide a further US\$31.2m in co-financing (cash and in-kind). UNIDO served as the GEF implementing agency, supporting project oversight and providing technical inputs where required. REEE was guided by a Project Steering Committee (PSC), chaired by Secretary of MoIP, including NPO and UNIDO, as well as Small and Medium Enterprise Development Authority (SMEDA); MoCC, Alternative Energy Development Board (AEDB) and ENERCON and involved industries.

REEE sought to address barriers related to the policy, incentives for development of robust domestic market for delivering technology and management solutions and an enhanced policy and regulatory framework on promotion of RE and EE measures in industry. An integrated and holistic approach that combined demonstration projects with high replication potential with interventions that sought to establish a market environment conducive to investments in clean energy practices and technologies was adopted.

**Table 1: Project factsheet**

<b>Project title</b>	<b>REEE - Sustainable Energy Initiative for Industries in Pakistan</b>
UNIDO ID	10054
GEF Project ID	4753
Region	Asia Pacific
Country(ies)	Pakistan
Project donor(s)	GEF



<b>Project title</b>	<b>REEE - Sustainable Energy Initiative for Industries in Pakistan</b>
Project implementation start date	June 01, 2014 <sup>7</sup>
Expected duration at project approval	48 months, actual duration was 94 months.
Expected implementation end date	Dec 31, 2022 <sup>8</sup>
GEF Focal Areas and Operational Project	CCM, Climate Change, CCM2, CCM3
Implementing agency(ies)	UNIDO
Executing Partners	AEDB, SMEDA, NPO, NEECA
Donor funding	USD 3.550 Million
Project GEF CEO endorsement / approval date	April 02, 2014
UNIDO input (USD)	USD 50,000
Co-financing at CEO Endorsement, as applicable	USD 31,200,000
Total project cost (USD), excluding support costs and PPG	USD 3,381,375

The following project components were developed to achieve the project objectives:

**Project Component 1: Develop the policy and regulatory framework on use of EE and RE in industry**

This component of the REEE aimed at reviewing the RE&EE policy frameworks and related action plans set to promote RE&EE, looking at the demand-side, in the case of this project, industry, and identify the obstacles preventing the achievement of these objectives.

*Expected Outcomes*

Creation of a conducive Policy and regulatory Framework. This would be achieved by preparing recommendations on improvements in policy and regulatory framework adopted and associated advocacy worked.

**Project Component 2: Investments in RE and EE in industry**

This component was supposed to show cases the reliability and viability of the use of RE in Pakistan as well as the huge savings that could be achieved by applying the principles of EE and Energy Management Schemes (EnMS).

*Expected Outcomes*

Investments in RE and EE in pilot demonstration carried out and scaled up.

**Project Component 3: Create platform for promoting investment and sustainability**

This component was to support existing investment platforms to promote investments in RE&EE projects in close collaboration with national financial institutions, by strengthening existing “business service offices desks” in Pakistani organizations (such as SMEDA, NPO), by having specific ‘energy promoting energy-related investments in industry for energy

<sup>7</sup> De facto the project started in February 2015, main stakeholder see this as the starting date

<sup>8</sup> The project was extended two times, last extension was agreed to give sufficient time for terminal evaluation and project closing

information supply, best practice disseminations and providing advice on finance opportunities and existing government support instruments (regulations, incentives).

*Expected Outcomes*

Investment platform for scaling up investments operational.

**Project Component 4: Monitoring and Evaluation**

Efficient project management including M&E and knowledge management would ensure smooth project execution and uptake of the learnings. Project implementation would be monitored and evaluated on an ongoing basis during the project implementation and after the project period.

*Expected Outcomes*

Project's progress towards goals confirmed and/or necessary adjustments made. Knowledge to be disseminated.

**Project Theory of Change**

Theories of change (TOCs) are a common management tool expressing the basic rationale behind an intervention. They describe the results an intervention aims to achieve, how the intervention works towards those results, and the main assumptions behind the intervention's approach. In turn, TOCs also support the identification of key elements that should be evaluated. As such, TOCs are frequently used as the starting point for developing evaluation approaches, and for identifying evaluation questions.

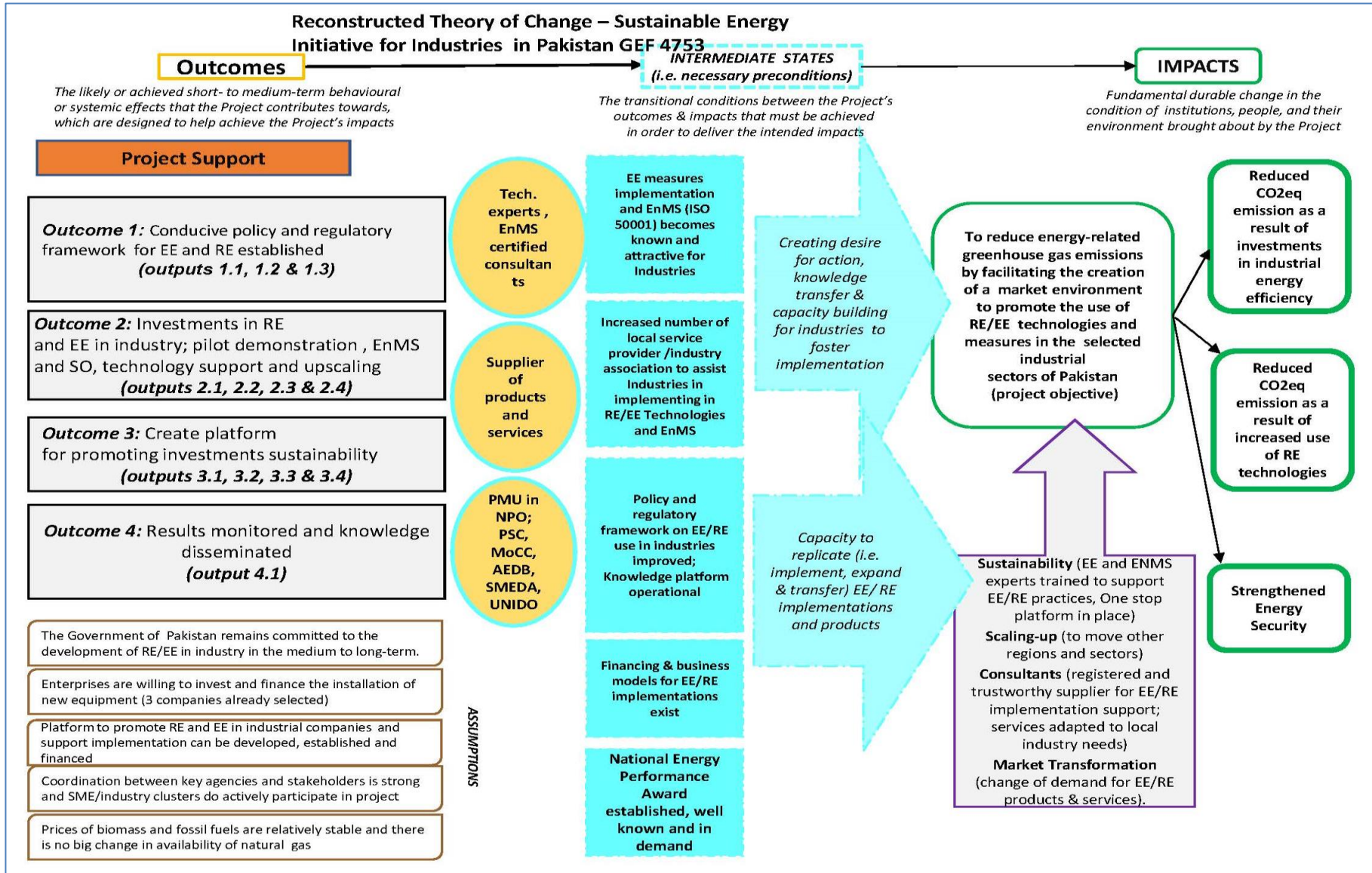
There was no explicit theory of change developed for the REEE project. But the project documents and the logical framework provide information about identified barriers, assumptions and risks and enabled ET to reconstruct the ToC during the evaluation's inception phase.

The main conditions leading to the changes - as indicated in TOC diagram (next page) - to achieve the project goals are<sup>9</sup>:

- (i) Industries will improve their EE, implement EnMS or even switch to RE sources if:
  - Enabling policies and regulatory framework (including financial and non-financial incentives and instruments) are in place
  - Investment platform to promote RE and EE is available, easily accessible and supportive for decision makers in industries
  - Certified experts on RE&EE and EnMs applications are locally available and trustworthy
  - National Energy Performance Award is established, well known and asked for
  - Awareness towards RE&EE is raised, highly efficient trainings lead to skilled personal to work on EE, maintain EnMS and further maintain RE components
- (ii) Awareness among all relevant stakeholders can be raised
- (iii) Effective capacity building will enable RE&EE experts to provide efficient support locally

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<sup>9</sup> Excerpt from CEO Endorsement GEF Project Document 10045, UNIDO 20. 02. 2014



Theory of Change reconstructed by ET, from inception report; INCEPTION REPORT GEF 4753, adapted in Feb 2023

## II. Evaluation objectives, methodology and process

### Evaluation scope and purpose

The terminal evaluation (TE) was carried out as an independent in-depth evaluation using a participatory approach whereby all major key parties associated with the project have been informed and consulted throughout the evaluation.

In line with its objectives, the evaluation had two main components. The first component focused on an overall assessment of performance of the project, whereas the second one focused on the learning from the successful and unsuccessful practices in project design and implementation.

### Evaluation audience

The primary target **audiences** for the evaluation are:

- **UNIDO management**, particularly those with direct responsibility for the design and implementation of REEE and other projects with similar objectives on RE and EE implementations.
- **AEDB, SMEDA, NPO and NEECA** representing the project's executing partners, having significant influence on the dissemination, uptake and sustainability of any results achieved through REEE.
- **MOIP and MoCC**: MOIP MoCC the GEF's focal point in Pakistan, so both Ministries had integral roles in REEE delivery and future uptake and sustainability of any results achieved through REEE.
- The **GEF Secretariat** who continue to develop and deliver programs on RE&EE in the world.

### Evaluation team

The evaluation team (ET) comprised one international Team Leader, one national Evaluation Expert. The two team members were contracted by UNIDO for this specific evaluation. The team received logistical support (travel, interview scheduling, site visit support) from UNIDO offices in Vienna and Pakistan.

### Evaluation framework

The evaluation purpose and objectives, the theory of change, and the evaluative requirements of both UNIDO and the GEF all provided the basis for the evaluation framework, which in turn underpinned and guided the whole evaluation approach. The framework was structured against the standard OECD-DAC criteria agreed for the evaluation (relevance, coherence efficiency, effectiveness, sustainability). The framework identified key evaluation questions, supported by guiding sub-questions. The full framework is presented in Annex 1, the six key evaluation questions are presented below:

1. **Relevance:** How relevant was the project to the needs and priorities of Pakistan, and to the mandates of UNIDO and the GEF?
2. **Coherence:** To what extent was the project aligned with – and complementary to – other work being delivered in Pakistan?
3. **Efficiency:** How efficient was the project's delivery?
4. **Effectiveness:** Did the project achieve its planned outputs and outcomes?
5. **Progress to impact:** How likely is it that the project's outputs and outcomes will contribute to long-term impacts?
6. **Sustainability:** To what extent are the project's outputs and outcomes likely to be sustained in the long term?

## Methods and tools

The evaluation used mixed methods to collect data and information from a range of sources and informants. It paid attention to triangulating the data and information collected before forming its assessment. The ET has identified causal and transformational pathways from the project outputs to outcomes and longer-term impacts, and drivers as well as barriers to achieve them.

In preparing this TE report the ET reviewed the documentation of the project provided by the UNIDO's Project team, consulted key project stakeholders and conducted a 15-day mission to Pakistan to meet stakeholders, experts and the project beneficiaries and to discuss the results in details with local stakeholders.

Overall evaluation team met **66 people (12 of them female)** representing the main stakeholders and project beneficiaries.

Guided by the evaluation framework, the following common evaluation tools were applied to gather and analyze qualitative and quantitative information:

- **Interviews:** 66 individuals participated in interviews, mainly face-to-face discussions in Pakistan and a few remote meetings (via Zoom).
- **Survey:** A short online survey with experts trained by the project was conducted. 72 experts have been contacted and 29 answered the questions leaving a respondent rate of 40%.
- **Site visits:** The ET undertook 7 site visits to Demo Sites in Karachi, Lahore, Chiniot and Islamabad and 7 visits at main stakeholder offices.
- **Desk review:** A comprehensive literature review considered all relevant documentation such as materials produced through the project (including mid-term review, progress reports, policy documents, technical guidelines, Steering Committee minutes and financial data), and relevant external documentation (including policies and legislation influenced by REEE).
- **UNIDO and GEF ratings:** All UNIDO evaluations are required to rate a series of evaluation and project criteria against a six-point scale, ranging from 'highly unsatisfactory' to 'highly satisfactory'<sup>10</sup>. The project's ratings are presented in chapter 4 and Annex 2 of this report.

## Limitations

Few of the planned (online) meetings with key stakeholders could not take place due to unforeseen reasons (time constraints, not able to arrange a suitable time for a meeting) during the review mission.

Due to a very recent change in MOIP personnel, the Deputy Secretary (DS) Investment Facilitation (IF) of the MOIP just joined the office on the day of the meeting with ET. As such the DS could not share insights from his ministry regarding the project design, implementation, performance and results. The DS, however, showed the ministry's interest in the RE&EE related activities due to energy crisis in the country and the government's efforts to resort on alternate sources of energy.

GEF focal point at MoCC was not in the country during TE visit, but a representative could meet the evaluation team on his behalf, ensuring his support for UNIDO's work in Pakistan.

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<sup>10</sup> See page 24, [UNIDO Evaluation Manual](#), 2018.

### III. Evaluation findings

#### 1. Relevance and Design

##### Relevance of the project objectives

At the time of project design a baseline line study was conducted earlier suggesting that very limited knowledge and information were available to the sector due to the following factors;

1. Lack of awareness about the usefulness of energy data culminates in absence of an energy monitoring system in the industry
2. Lack of capacity and resources in sector associations for collecting such data/information from their member factories
3. Lack of government department's capacity entrusted with industrial development research, statistics and other initiatives

Low priority was given to the energy efficiency over the energy security issue, which was the major concern before the project start. All these factors can be accounted for the dismal performance of the industrial players in country making the REEE project highly relevant to the sector improvement. Introducing and facilitating the B2B approach to install PV panels made the project more relevant as the approach is being followed by other companies - there are five companies that have acquired Distributed Generation License. They followed in the footprints of Shams Power which was a company participating in the project and has become an iconic model as a result. So essentially the UNIDO and GEF have not only strengthened the B2B approach but initiated an energy transition for green and clean industrialization in Pakistan, rendering the project more relevant to the country-context in particular.

##### Relevance of the project design

The original project design which was to create awareness and understanding for EE&RE implementations and to bring EnMS with ISO 50001 standards to Pakistan was and still is highly relevant to the country context. Most of the project outputs and activities were in line with Pakistan Government priorities as well as with UNIDOs and GEFs focus on SDG 9 and 7 and GHG reduction. The design fitted to the actual needs of the country in 2013, but had to be adapted to actual needs. For example, the planned projects on Biomass had to be dropped due to change in economic conditions.

The project was very relevant to the target group and project stakeholders. The multi stakeholder approach and the high number of workshops, technical meetings and experts' discussion created a strong sense of ownership for project results among the national stakeholders. They also led to enhanced relevant stakeholders' knowledge and awareness for EE, EnMS and RE. RE&EE technologies have been quite new to Pakistan's industries as REEE was the first of its kind in the country. Industries did not have the resources and the knowledge to do the needed implementation by themselves and no locally credible show case/ best practice examples existed. All stakeholders interviewed emphasized on the usability of the project results at all levels.

- The project relevance is rated **satisfactory**, on account of high relevance in terms of target group and overall objectives, and overall relevant project logic and design, with the shortcoming of non-available funds (co-finance) from GOP.

## **Project design**

The project was designed appropriately by involving all key stakeholders particularly the public sectors organizations. The design of the project was adequate to address the energy problems in Pakistan. It met the needs of the target groups to a greater extent, and was consistent with UNIDO's inclusive and sustainable industrial development. The applied project approach is appropriate, and the design is technically feasible based on best practices. The institutional and implementation arrangements as mentioned in the project document are still valid and relevant.

The combination of showcasing technologies for RE&EE and their viability under local conditions (component 2), with technical trainings to form a pool of energy experts (component 3) to further utilize and maintain these technologies are proven approaches and worked especially well in Pakistan. Together with the support of policies and the regulatory framework the Project Objective to create "... a market environment to promote the use of RE&EE technologies..." could be achievable.

One shortcoming in the design phase was the focus and reliance on a few (preselected) industrial companies. Due to several external circumstances the originally planned pilot projects did not materialize, but PMU successfully adapted the plan and worked with more and smaller business entities and created even easier to replicate showcases.

- The project design is rated **satisfactory**, on account of high relevance in terms of target and overall objectives, and overall relevant project logic and design.

## **2. Coherence**

The project was well-embedded within national political and legislative structures and was highly complementary to other work being delivered in Pakistan. The project's policy coherence benefited from the involvement of the Ministry of Industries and Production, the Ministry Climate Change, and the relevant national and sub-national level authorities.

### **Project design was inherently coherent with regional and national policy**

The REEE project responded to and was aligned with Pakistan's 11th and 12th Five-Year Plans which stated that "For efficient and effective exploration and exploitation of the energy resource potential, an integrated energy planning for fuels and renewable energy is required. It also emphasises importance of the institutional restructuring in the energy sector besides revamping policies, governance, regulation and capacity to overcome the prevailing energy crisis". The project was therefore inherently coherent with the national policy. The Five-Year Plans' calling for local and national level involvement in the introduction and development of Pakistan's Electric Vehicle (EV) sector also ensured that REEE was equally coherent with national, regional and city-level policy agendas and developments.

### **Informing ongoing and future policy development**

Beyond the project's fundamental alignment with current national and regional policy, the intention was always for REEE to inform ongoing and future policy development (Component 1 of the REE project). UNIDO collaborated with the Ministry of Climate Change along with government institutions including SMEDA, NPO, NEECA, AEDB working on the same themes and achieved many successes through collaborating with its existing channels, networks, and contacts to ensure learning and policy recommendations. While the long-term impact of REEE policy-focused work was yet to be measured, REEE at least was in a strong position to ensure that the policy-relevant outputs could continue to influence ongoing and future policy development.

### **Coherence further strengthened through involvement of UNIDO and GEF**

The support of both UNIDO and GEF – and the associated necessity of having cross-ministry involvement from both MOIP and MOCC – gave REEE a higher profile within Pakistan. The presence of the Federal Minister for industries, and other public and private sectors representatives involved in the Energy sector in Pakistan in the UNIDO's ceremony of prize distribution, evidenced the perceived importance of the project. The commitments made by the authorities to RE related initiatives by UNIDO/GEF helped build engagement and commitments from all levels of government and from the private sector.

Industries involved with the UNIDO REEE initiatives noted how the project had helped to bring private sector companies together to deliver a single, coherent strategy. The awareness created by the REEE project across the Pakistan's industrial sector by adopting more cohesive and collaborative approaches on adopting the Renewable Energy with a lens of Energy Efficiency - a supportive climate for adaptation of Renewable energy and Energy efficiency measure in Pakistan has emerged and many stakeholders of the REEE have shown high interest to support the project activities.

REEE was following the principles of Agenda 2030/SDGs and had an impact on other SDG goals, such as SDG 4 (trainings on EE&RE, EnMS, CEA CEM), 5 (see chapter IV/8), 7 (12,5 MW of PV capacity installed) and 8 (improved competitiveness through EE and RE investments).

The project interventions were largely compatible with other interventions of the government and development agencies. For example, USAID/Pakistan has also concluded one project on renewable energy and a new activity has been awarded on the same themes as that of REEE project. Thus, the REEE project was the pioneering initiative with visible footprints on the ground for relevant stakeholders, for leveraging the benefits and taking them forward.

- The project is rated **satisfactory** on coherence, reflecting its alignment with SDGs and other project work in the sector.

### **3. Project Logical Framework**

The Project logical framework (log-frame or PLF) included an overall credible results chain with measurable indicators. Project components and activities are well-targeted, clear and consistent in the PLF. Outcome and Outputs are well defined. Realistic, but challenging indicators including means of verification have been included in the design phase.

#### **M&E design and implementation**

M&E design included the Project Logical Framework (PLF) which includes indicators at outcome level. M&E system functioned well. Feasible indicators were provided for most outputs. Most of targets provided were consistent with activities described. But jointly amended outputs were not reflected in the PLF, e.g. for the shift to 50 Energy Audits and the drop of the textile training centre, no indicators were introduced/changed.

Project Progress update and the Annual Work Plan were used for planning and corrective actions and were discussed with stakeholders in PSC meetings.

Calculations for CO<sub>2</sub>/GHG reductions have been discussed in detail during TE mission and were feasible. For investments in PV the lifetime calculation was used, but this was more difficult for EE implementation as an average lifetime for the various activities cannot be predicted. ET worked with the assumption of 10 years average lifetime of EE investments.

PLF was never revised/adapted since project start in 2015 and was not used as a project management tool. Any agreed change (discussed in PSC meetings and documented in Meetings' minutes) was not reflected in the PLF. For most of those agreed changes, indicators have not been adapted. For example, the highly effective cooperation with the National Rural Support Programme (NRSP) was not visible in the PLF.



To ease project execution the PLF should be used as a tool for project work and translated into a day-to-day monitoring tool to help keep track of overall objective along with activities being implemented. Adding a few columns to the PRF would enable PMU team to easily monitor the progress.

- The project logical framework was rated **satisfactory** on account of an overall clear framework and indicators, but adaptation to reflect the jointly agreed changes in outcomes, targets and indicators was missing.

#### **Results-based work planning, monitoring, evaluation and reporting**

Work plans and project status were regularly updated and jointly agreed, and the process was result based. Identified actions and project progress was monitored through regular meetings and reports.

However, project results (in terms of outputs, outcomes and impact) were not always monitored against the PLF. Project planning and implementation could be strengthened with the use of the PLF, which would also need to be translated into day-to-day planning and monitoring activities.

Equally, as the project saw several changes in expected outcomes (e.g., training centre by NPO and planned 130 energy audits dropped, number of supported demonstration projects changed from 3 to almost 20, number of trainings and trainees raised from 120 to 830+). The PLF should have been revised to reflect the changed objectives. Accordingly, a revised list of indicators would have helped to guide project monitoring of expected outcomes (e.g., to monitor the outcome of the trainings and built capacity).

- The degree of **results-based management is rated satisfactory**. REEE has been adapted in response to missing co-financing from (GOP) stakeholder (training centre by NPO dropped) and changed market conditions (dropping biomass pilots) and has changed in response to COVID-related challenges.

#### **M&E implementation**

The project had a functioning M&E system; activities were appropriately monitored (monthly project status), minutes, attendance sheets were available. The PSC met 4 times as mandated and was chaired by the Federal Secretary<sup>11</sup> MOIP. Annual reporting on Project Implementation Reports (PIRs) and Project Progress updates was carried out at the outcome and output level and shared with PSC members and experts from technical committees.

As the project saw drastic changes at the starting point on the ground, the 2 tables from the endorsement document were not utilized to track the data. Instead of the original tracking table different tools to monitor the savings from EE activities and the implementation of PV systems, have been utilized. Calculations for CO<sub>2</sub>/GHG reductions have been discussed in detail during TE mission and are feasible. All investments from industrial units that received financial support from REEE had to include appropriate monitoring into their implementations. This enabled REEE team to cross-check the results and calculate the savings in great detail.

- **M&E system** is functioning well and **rated satisfactory**. Activities recorded accordingly, investment and saving figures well monitored; but indicators not adapted to amended project plans

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<sup>11</sup> Chair has seen several changes in most of PSC meetings. These changes and lack of continuity is seen as an issue by the stakeholders.

## 4. Efficiency

Efficiency assesses how economic and other resources and inputs (funds, expertise, time etc.) are converted to results.

The project ran between June 2014 and December 2022. REEE was initially planned to run for four years. The project was extended two times, last extension was agreed to give sufficient time for terminal evaluation and project closing, so finally it ran over a period of 94 months. The extensions were needed to address several developments that emerged during implementation.

The project saw several changes in the political landscape of Pakistan causing delays at project start. Identification and selection of the project partners took more than expected time as the project strategized its approaches from working with the initial few top-notch industries to a higher number of medium to small scale industries. From March 2020 onwards Covid related travel restrictions made project implementation difficult and (international) experts and trainers could not continue with their work in the country. Finally, another extension was needed to achieve project results and conduct the terminal evaluation. Ultimately REEE delivered targeted outputs, despite various delays imposed by security concerns, identification and selection of national partners, political uncertainty, and the shock imposed by the COVID-19 pandemic.

Although the project was extended for 46 months, stakeholders did not raise any serious issues regarding the timing of delivery. Project extension worked in favour of the project, for the main beneficiaries those results came in timely to support future plans from various ministries.

### **Project expenditure**

At the time of the TE mission in September 2022 around 98.5% of project funds were spent<sup>12</sup>, and the 1.5% was planned to be utilized for remaining activities (i.e., closing and promotion event), i.e., USD **3.500.783**. Changes to fund allocations as a result of actual planning and budget revisions were documented properly and appropriate.

At the project start, it became obvious that cash and in-kind contributions from the main executing partner NPO and originally identified industries would not materialize due to the lack of funds from the former and the lost interest from the latter, because of low saving potential at that time. The UNIDO team and involved stakeholders showed adaptive management by changing some project outputs and adjusting the financial planning, accordingly. All changes have been discussed and agreed upon in PSC meetings. High flexibility and adaptability were needed to handle the massive project extension, the GEF fund money could be stretched to suffice for the whole project duration.

The table on the next page shows the finance status from GEF funds and co-financing from the private sector at Mid-term Review (showing the status of March 2019) and TE (Status: September 2022).

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<sup>12</sup> Source: UNIDO database, from 3<sup>rd</sup> September 2022

Co-financing from industries, NRSP and Shams Power was significant. The monitoring scheme for co-financing was done in great detail and jointly agreed upon between the main stakeholders. The latest figures showed the <b>total co-financing of USD 20,54 Million</b> , most of it (20,47 Mio USD) in cash and coming from the 56 units that received direct support from REEE project. These figures showcase the viability for EE and PV in Pakistan. <b>Project component</b>	GEF financing (in USD)		Co-financing (in USD)		
	Approved	Actual	Promised	Midterm	Actual
1. Develop policy and regulatory framework to support the uptake of EE and RE in the industry	229,043	346,193.56	1,000,00		
2. Investments in RE and EE in the industry	2,592,352	2,191,376.09	26,800,000	748,118	20,544,648
3. Create a platform for promoting investment and sustainability	496,000	712,753.62	2,400,000		
4. Monitoring and evaluation	64,000	75,907.37	50,000		
<b>Subtotal</b>	<b>3,381,375</b>	<b>3,326,230.64</b>	<b>30,250,000</b>	748,118	20,544,648
Project Management	168,625	174,551.98	950,000		
<b>Total (in USD)</b>	<b>3,550,000</b>	<b>3,500,783.3</b>	<b>31,200,000</b>	<b>748,118</b>	<b>20,544,648</b>

**Table 3: Project budget, utilization, and co-financing**

Mainly technical support was provided to companies; only 18 received direct grants from the project (overall USD 764,607). These grants triggered an investment of USD 11.86 Mio. The remaining investments from companies have been triggered by technical support without grants(!).

#### **Project Coordination and management**

The project also demonstrated well-justified, pragmatic adaptive management to changes in the operating context, as PMU had to make some changes at the outcome level (see details under 5 Effectiveness) to meet various stakeholders' demands and to adapt to the actual situation in the country. All changes have been reported and discussed with main stakeholders and jointly agreed upon during PSC meetings. Looking at the final outcomes and outputs of REEE project, the Evaluation team assessed that these adaptations were needed and suitable.

The NPO could not host the PMU and conduct the 130 energy audits as planned in the project document due to the lack of funds. Therefore, UNIDO office in the country was assigned to host the PMU and the National Project Coordinator (hired by UNIDO) came on board in Feb 2015. The PMU was responsible for project management and implementation in UNIDO Office in Pakistan headed by UNIDO Country Representative with 2 fully employed experts - the National Project Coordinator and the Project assistant - and one part-time communication expert. The PMU based in UNIDO Country Office was the only option to overcome the shortcomings of NPO.

UNIDO HQ project management gave the needed support, and reporting toward the GEF focal point was done as mandated. PIRs and Project Progress Update Reports were prepared regularly, but not all of them were written with the needed quality and fully reflected the agreed changes. It was a great advantage that the National Project coordinator has been with the project since the project started.

Most of the lessons from MTR have been utilized to improve project performance, especially those within the influence of PMU.

**As a pilot initiative to transfer the project management from UNIDO headquarters to the field offices, the project implementation responsibility was shifted in April 2020 from the HQ project manager to the UNIDO Country Representative in Pakistan:**

- Project Manager (PM) in HQ is responsible for M&E component and would be the overall manager
- UNIDO Country Representative (UCR) took over the responsibility for all technical components and deliverables (staffing, procurement, etc.).

This pilot management scheme worked well for the project and has helped to turn it from being at-risk to a well performing project. The Project Manager from Field Office (FO) in Pakistan, under the guidance and backstopping from HQ, was able to timely drive key strategic changes. The PM successfully utilized the resources available including the local project team, while delegating and assigning key roles. Regular calls were then organized between PM, UCR and the technical team to discuss progress on the project and attend to issues/challenges.

The key advantage of this initiative was that FO was given full responsibility in the decision-making process when it came to addressing challenges that were very much local in nature. It expedited the decision-making process and the project was able to adjust quickly to changing scenarios.

On the administrative side, there were few turnovers of team members at critical stages, for which new recruitment and replacements were made swiftly, leveraging from connectivity with local resources available in the market as well as working on stop-gap arrangements from other project teams in between the replacements. The team members from FO and other projects were jointly utilized, such as on administrative, technical, and communication staff levels, this improved not only the efficiency but helped learnings among the projects as well.

The direct supervision on identifying and selecting partners has enabled the project to work with right kind of partners, as well as to build long-term partnerships. One such example was National Rural Support Program (NRSP), a micro finance institution which was supported to provide financing solutions for RE, a business model which has been upscaled by NRSP and replicated by other players.

The following **key factors for successful delegation** of projects to the field (FOs) are:

- UCR should have the technical background and be politically savvy, which was the case for UCR in Pakistan
- Willingness by HQ to give full responsibility for the managed project components to the FO
- Mutual interest in collaboration and trust

#### **Stakeholder engagement**

As the objective of the project was in-line with the national priorities, the government stakeholders supported the objective of the project. They played a role in the project decision-making and supported project implementation, but there was a lack in continuity as personnel from ministries changed frequently. In all ministries there has been fluctuation in key personnel and there was also a significant change in the political landscape of Pakistan. PMU reacted flexibly to those changes which did not have a severe negative impact on major outcomes, but one. The biggest issue was a lack of funding for NPO personnel, therefore the number of energy audits had to be reduced and the idea of establishing a textile training centre at NPO was dropped. This also resulted in the fact that the funds from state bank were already exhausted and industries, especially the smaller ones, cannot finance their planned implementations.

#### **Communication**

Meeting minutes and reports were properly prepared and circulated, and feedback mechanisms with stakeholders were functioning.

There was no specific focus on external communication (beyond main stakeholder and potential beneficiaries) on the project from the start. The project did not develop its own logo and website and even used 3 different names (REEE, SEIIP and SEI).

In the final phase UNIDO project management team was supported by a communication expert and could catch up with making the results known to the public. Multiple brochures were prepared, such as the final brochure that highlighted all the results and impact finally achieved. Thematic videos were also prepared by the communication team from time to time highlighting the projects results.

The Energy Help Desk (run by SMEDA) and other activities like the Energy Award, with its Awarding Ceremony in August 2022, created a lot of visibility that supported the awareness of stakeholders and industries on RE, EE and EnMS.

- The project efficiency is rated **satisfactory** on account of the high number of demonstration project realized in different industries (even with small rural communities through NRSP) and the high number of experts trained and now working as Energy experts in Pakistan. Within the given budget REEE could achieve the envisaged GHG emission reduction and the planned Co-finance from participating industrial units.

## 5. Effectiveness

This section reviews REEE main results in terms of outcomes and outputs. Details of the outputs (outcomes) indicator targets and achievements as well as ratings per output are provided in Annex 2 - Progress towards expected results based on the PLF.

**Project Component 1: Develop the policy and regulatory framework on use of EE and RE in industry** aimed to create a conducive Policy and regulatory Framework. This was expected to lead to three outputs:

**Output 1.1:** Existing policy and regulatory framework reviewed and recommendations made

REEE conducted a detailed study on <sup>13</sup>“Policy reviews and recommendations on the promotion of renewable energy and energy efficiency in industries in Pakistan Report”, the first draft was published and discusses among major stakeholder.

**Output 1.2:** Recommendations on improvements in policy and regulatory framework adopted

The above-mentioned study was discussed in multi stakeholder verification workshop (2 days in April 2017 with different stakeholder) and action plans developed. With all these inputs the final version of “REEE Policy Review Advisory Final Report” was published (Dec 2017) and accepted by main stakeholders.

Results on the ground were already visible, the learnings and recommendations from the Policy report have been utilized and included in “Alternative Resources for Energy (ARE) Policy 2019” and were also incorporated in the upcoming National EE & Conservation Action Plan (2022).

Furthermore, REEE outcomes can be used to support and have been already supporting enhanced goals on GHG reduction and use of RE for Pakistan.

**Output 1.3:** Sectorial analysis on RE&EE opportunities

REEE ‘Sectoral Analysis on Renewable Energy and Energy Efficiency was published in August 2019 and covered Ceramic, Dairy, Foundry, Pulp and Paper and Textile Sector. This Sectoral Analysis was the first of its kind in Pakistan and set a valuable baseline for decision makers and future work in the field. A brochure ‘Sustainable energy Initiative for Industries in Pakistan – promoting a market environment to stimulate investments in Renewable energy and Energy Efficiency project to avoid GHG emissions’ was produced highlighting the project results and impact and shared with stakeholder and industries.

**Expected outcome 1:** Policy and regulatory framework on RE&EE use in industry improved.

During TE mission it was visible and confirmed during most of the interviews that REEE has initiated a major improvement on the framework for RE&EE. Involved ministries and government bodies recognized and appreciated the results of REEE project and highlighted an improved understanding about the opportunities and merits of RE&EE to reduce GHG emission. Furthermore, an ‘enabling environment’ has been created, appropriate tariff related mechanism (e.g. net-metering) are in place and have become a common practice. B2B models to implement PV plants have been introduced and tested; project partner Shams Power set a benchmark by acquiring the first “Distributed Generation Licence”. At project end, 5 companies have got a licence now and have been providing services to industries. Due to the improved framework investments to improve energy efficiency, Renewable Energy (mainly in PV) has become an attractive and viable opportunity for industries.

**Component 1 has achieved the expected Outputs and Outcomes.**

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<sup>13</sup> A contract was signed between UNIDO and Full advantage Company in September 2016 on preparing this study

**Project Component 2: Investments in RE and EE in industry** targeted to showcase the reliability and viability of the use of RE in Pakistan as well as the huge savings that could be achieved by applying the principles of EE and EnMS.

**Output 2.1:** Projects on EnMS and Systems Optimization (SO) assessed and implemented

Due to lack of co-financing from the main executing Partner NPO, it was jointly agreed to amend this activity. Instead of doing energy assessments for 130 companies, a **detailed analysis for 50 industries** was conducted and EnMS and EE plans developed. 11 companies have completed ISO 50001 (EnMS) certification, several others are currently working on it and planning to become certified in 2023. Almost all involved companies improved their energy efficiency drastically, invested in System Optimization and Energy Efficiency and achieved significant savings in terms of money, energy consumption and CO<sub>2</sub> emissions. Showcases and success stories have been created to prove the business case for those investments and a short pay-back period. Overall activities under output 2.1 lead to **investments** from participating industrial units of **2,416 Mio Pakistan rupees and monthly savings of 538 Mio rupees** (with an average payback period of less than 4.5 months).

The implementation with the technical and/or financial support of REEE project led to **annual GHG emission reduction of 163,240 tCO<sub>2</sub>e, against 76,725 tCO<sub>2</sub>e targeted**<sup>14</sup>.

**Output 2.2:** EE and RE technology support in 1 textile unit

The activity for Output 2.2 was planned at PPG phase with a specific industrial Unit, but could not be established due to its lack of interest this company. Instead of this specific pilot project, multiple other demonstration projects in different companies have been successfully installed (see Output 2.3). The **actual installed capacity** – with direct support from REEE – **is 12.5 MW**, against 12 MW planned. A total of 570,000 USD was granted by the project and the industry invested USD 11 million. The PV instalment in Pakistan, that was triggered through showcasing the viability and development of the business model, but was not directly resulted from the project, was not monitored, but significant. As an example, Shams Power itself has in total installed 27MW under the jointly developed B2B business model<sup>15</sup>!

An additional activity (that was not part of the endorsement document) was introduced and jointly agreed during the first PSC meeting (but not amended in the PLF) that helped to replace the planned output 2.2. Support for rural communities created the business case for Microfinance model. This approach capacitated microfinancing entity National Rural Support Programme (NRSP) to work in the area of RE technologies and enabled them to replicate this model. Through this initiative, implemented in 4 districts of Sindh and Punjab provinces with a cumulative capacity of 1,321 kW, UNIDO enabled small businesses and farmers in rural areas of Pakistan to enhance their productivity and improve their livelihoods both in terms of cost reduction and increase in productive time available to them with no fear of power outages. The installed capacity is capable to produce 1,825 MWh annually.

**Output 2.3:** RE technologies assessed and implemented in 2 companies

At project start it was jointly decided to skip the technical support to a biomass power plant and to focus towards PV only, as the frame conditions (raw material availability and production costs) were not supportive for biomass. Instead of two large projects (6 MW each), 18 smaller units with an overall capacity of 12.5 MW have been installed successfully with technical and financial support from REEE project.

The PV installation with the support of REEE project (technical and/or financial) led to **annual GHG emission reduction of 7,169 tCO<sub>2</sub>e or total savings over the investment period (20 Years) of 143,380 tCO<sub>2</sub>e**.

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<sup>14</sup> See GEF tracking tool, page 56 in endorsement 100045, UNIDO, signed on 29<sup>th</sup> Feb 2014.

<sup>15</sup> This figure was shared during interview with Shams Power team on 2<sup>nd</sup> Sept 2022

Net-metering is now in place and a common practice to feed excess energy to the grid at attractive rates. REEE supported this first service provider to get Distributed Generation License under NEPRA. At project end 5 companies have such a licence and provide service to industries. **PV is now seen as a viable option with a short 'Return on Investment'**, especially with current energy prices. Multiple successful show cases could enhance visibility and replication.

From the stakeholders' perspective it was correct and efficient to move towards PV. REEE has proven that PV is very much suitable to Pakistani climate conditions and for industries.

**Output 2.4:** Portfolio of implementation of EnMS/SO and deployment of RE elaborated

Showcase and best practice examples, list of service provider and investment opportunity list is available on Energy Desk website (see details under output 3.1)

**Expected outcome 2:** Investments in RE and EE in pilot demonstration carried out and scaled up

Flexible management has been demonstrated. Project planned outputs were revised and adapted when the project started. Due to the ground situation, the originally planned industries (as per the endorsement document) lost interest. Because of changed conditions the focus was shifted from Biomass towards PV and from 3 main demo projects to around 20 smaller ones and additional support to rural communities (through NRSP) was given. This change led to more successful showcases proving the viability of this technology for multiple industries and regions and also in the rural context.

Investments in RE&EE are a viable business opportunity and REEE could prove that available technologies are fit for Pakistan industries. Local service providers and experts (Energy manager) can support industries with implementation leading to very attractive pay back periods. **Scaling up from pilot projects to 'mainstream' has already started** and will be supported in the future by awareness created by REEE project and the experts trained. 50 + companies are working on EnMS and EE and continue to realize energy savings even beyond the project period. The latest development on energy prices due to the actual energy crisis supported outcome 2 and will ensure further replication in Pakistan industries. All industrial units the ET met confirmed that support from REEE had just come in the right time to enable them (and will enable even more in future) to efficiently deal with the drastic rise in energy costs.

**Component 2 has achieved the expected Outputs and Outcomes** and they came just at the right time to support Pakistan industries.

**Project Component 3: Create platform for promoting investment and sustainability** aimed to support existing investment platforms to promote investments in RE&EE projects in close collaboration with national financial institutions, by strengthening existing "business service offices desks" in Pakistani organizations.

**Output 3.1:** Investment platform to promote RE&EE in industrial companies strengthened (non-grant instruments, banking products; awareness creation)

The one-stop energy Desk (<https://energydesk.smeda.org/>) is functioning, run by SMEDA and is being utilized by industries. It was developed and put in place (testing phase) in 2021, official launch event was organized with Energy Awarding event in August 2022. SMEDA is currently ensuring feedback and ongoing support and is monitoring the number of visitors and support given. At the time of TE visit (September 2022) the webpage had already 1300 visitors and individual support was given to around 100 units. SMEDA confirmed that the fund to run this service is secured even beyond the project completion date<sup>16</sup>. The Energy Desk is and will likely be in future especially helpful for smaller units that do not have the resources to focus on research work and benchmarking.

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<sup>16</sup> ET did last check up on 20th Feb 2023, Energy Desk is still fully functioning



**Output 3.2.:** Training and Certification Centre and Textile Training Facility for experts on RE and EE- EnMs applications established (under NPO)

Due to lack of funds from main executing Partner NPO it was jointly agreed to skip this activity. This shortcoming was partially replaced by extended activities under 3.3. More trainings, including a much higher number of trainees have been conducted (see Output 3.3.).

**Output 3.3.:** Training of experts on RE&EE in industrial applications carried out with at least 20% women

Selection of trainers and trainees was very successful and lead to 20+ different trainings and supported around 625 trained experts (instead of 120 planned) and 22 ISO 50001 became accredited professionals (18% women). They supported more than 50 industrial units towards EE and EnMS. Enhanced trainings overachieved the targeted numbers (at least 120 experts) by far (830+ participants, 100+ female, i.e. 12% female participation).

**Output 3.4:** National Energy Performance Award scheme introduced

Energy Performance Awards in Industries is in place and functioning. The award was introduced with 4 categories (including Best women professional in the Energy Sector) in 2021 and first awarding ceremony was held in August 2022 successfully. NEECA ensures that Energy Awards will be an annual practice and is part of the EE&C action plan.

**Expected outcome 3:** Investment platform for scaling up investments operational; Training centres operational and programmes established

All but one component (output 3.2) have been successfully conducted and will support industries in Pakistan to invest into RE&EE beyond the project period. Highly motivated and well-trained energy experts supported - and will do so in future - companies to improve their energy efficiency. Some of the experts work in industrial units being part of the EnMS/EE team, others are working as consultants or with service providers supporting multiple companies. Energy Award is likely to ensure that awareness on the RE, EE and EnMS is growing and will sustain. Interviewed stakeholders highlighted the award with its four components and companies are proudly presenting awards to customers and neighbouring units.

All major outcomes have been achieved and appreciated by the interviewed stakeholders. The TE could also identify several unintended positive outcomes, like the establishment of business model of microfinance for rural areas, which has proven that PV was also working there. In addition, the project kick-started a platform for interaction between different academia and industries and enabled a fruitful discussion and cooperation.

The Overall Project Objective was "... to reduce energy related GHG emissions..." with a target number of a "...cumulative reduction of about **2 million tCO<sub>2</sub> over the lifetime** of the investments linked with the project in various technologies...".<sup>17</sup>

PMU has been closely monitoring the savings from EE activities and the implementation of PV systems. For all implementation that received funding from REEE, detailed monitoring and sharing of results was obligatory. This enabled the project team to conduct feasible calculations for CO<sub>2</sub>/GHG reductions (overview is given in table 4). For investments in PV the lifetime calculation of 20 years was used. This is more difficult for EE implementation as an average lifetime for the various activities cannot be predicted. In the calculation a conservative figure with 10 years average lifetime was utilized. REEE only calculated energy and CO<sub>2</sub> savings from industrial Units directly supported by the project and did not take other positive side effects

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<sup>17</sup> See Project objective from the PLF, Endorsement 100045, UNIDO 20.02.2014

into account (e.g. reduced transport emissions, less air pollution when replacing coal or furnace oil).

The outcomes of REEE lead to direct annual savings of **7,169 tCO<sub>2</sub>e from PV plants** resulting into lifetime savings of **143,380 tCO<sub>2</sub>e**. The annual savings from EE are **163,238 tCO<sub>2</sub>e**, working with the assumption that average lifetime of EE savings is around 10 Years this will lead to a lifetime savings 1,635,000 tCO<sub>2</sub>e. **Overall resulting in a reduction of 1.78 Mio tCO<sub>2</sub>e.**<sup>18</sup> The actual results and explanations are given in **Annex 5 GEF result indicator/Tracking table**.

- The project effectiveness is rated **satisfactory**; most output targets achieved or exceeded, substantial progress towards most outcomes already visible. Two components did not materialize (due to changed frame conditions). Resources planned for those activities were efficiently redirected to other project components at early stage.

## 6. Progress to impact

The project has demonstrated the technical viability and commercial potential of RE&EE technologies and business models, and has supported some important policy developments. It has almost achieved its emissions reductions targets and much more reduction has been indirectly triggered by the project. **The main project objective to “...create a market...” has been already achieved.**

All this work has laid a strong foundation for delivering sustained impact within the participating stakeholders and beyond. While there are still some potential barriers to the broader uptake of RE and EE implementations, the learning generated through the project indicates how these risks and barriers can be addressed. Impact-level results are already evident, as described in the previous paragraph and shown in the table underneath.

<b>Implementations</b>	<b>GHG Emissions savings (TCO<sub>2</sub>e)/year</b>	<b>over lifetime</b>
RE	7,169	143,380
EE	163,238	1,632,381
Total	170,407	1,775,761

**Table 4: Achieved yearly GHG savings and calculated lifetime savings**

Beyond these immediate and easy to measure results, REEE has also laid solid foundations for further impacts. The extensive documentary outputs – policy recommendations, baseline study, technical guidance, best practice examples, attractive new business models, Energy desk and many more – are significant in themselves. Another asset for successful implementation of RE & EE in the future is the huge number of well trained and highly committed Energy Experts, with many already working for and/or well linked to industries. However, the potential influence of these outputs is arguably greater than the case for many other projects, due to the position and strength of the institutional ‘owners’ of these outputs. Involved ministries, NEECA and SMEDA will continue with their efforts towards broader use of RE and improved EE, further utilizing outcomes of REEE project. It was already mentioned that the Energy Award will become an annual practice and the Energy Desk and its support services will be maintained beyond the project period.

<sup>18</sup> This figure relates to direct savings that have been achieved with support from REEE project. Several service providers and consultancies ‘copied’ business models or took advantage of the showcases. These savings have not been monitored and included in the figures above. Shams Power for example installed already during project period overall 27 MW of PV, out of those only 12.5 MW have been part of the project and are included in the saving figures.

It is also visible that the main beneficiaries (mainly medium sized industrial units) have understood the viability of RE&EE implementation and learned from REEE how to start with implementations, where to get support (technical and financial), how business models are working and that the available technology is functioning in Pakistan.

### **How can the progress toward impact be sustained?**

The theory of change (page 11, above) summarised the rationale of REEE. If a conducive environment can be sustained and the use of RE&EE technology is seen as an attractive option, industries will continue to reduce GHG emissions. Applying the evaluation's findings to the theory of change and – in turn – identify where REEE has most clearly contributed to long-term changes, will support to sustain the impact.

As mentioned above it is needed that local stakeholders ensure that the outcomes of REEE are utilized beyond the project period and also smaller industrial units get access to the knowledge products. It is important that smaller companies are aware of new regulations, such as ARE policy and EE&C action plan and how to fulfil the requirements. The documents produced by the project have to become more visible, the outcomes (Awarding ceremony, Energy desk) have to be maintained on the long run and additional trainings for Energy Experts should be organized.

- The progress to impact is rated **highly satisfactory**; REEE could already create a massive positive impact regarding awareness on EE and RE among project stakeholder and beneficiaries; REEE has created a “market environment to promote the use of EE&RE” and contributed – and will do more in the future - significantly to GHG reduction

## **7. Sustainability**

### **Sustainability of Project outcomes**

Project implementation structure where the PMU was located in UNIDO Country Office with close cooperation with concerned ministries has supported RE&EE measures and would continue to support the uptake even more after the project completion.

Two entities have secured the functioning of support and awareness beyond the project end:

- SMEDA will continue EnMS support and maintaining the Energy Helpdesk
- NEECA ensures that Energy Awards will be an annual practice. The awarding scheme is explicitly mentioned in the EE&C Action Plan

The project trained more than 830 experts - more than 40 of them have been certified as EnMS experts or auditors. This supported several consultancies and established a linkage with Academia. Training and training materials have been rated by participants ‘overwhelming good’<sup>19</sup>. Furthermore, these trainings supported creation of awareness in industries for EE, EnMS, SO and PV appliances and will ensure that sufficient technical expertise is in place and active to secure sustainability of EE and RE implementations in Pakistan. This is true for specific sectors addressed by the project and front runner industries but needs to be expedited for additional sectors and smaller industries. Especially smaller units need more direct support and handholding as human resources for EE&RE are not available for them.

REEE could also establish and prove the viability of two business models on installation of solar panels. Net metering has become a common practice and attractive feed-in tariffs are available. This together with the actual energy prices will ensure many more projects on PV and EE will come up.

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<sup>19</sup> ET has conducted a survey among participants of the training

## Main risks to sustainability

### Financial Risk:

At present, with existing price level for gas, diesel and electricity no risks are visible. The payback period for solar panels has come down to 2.5 months. And the investment on EE supported by REEE had on average a payback period of around 5 months only.

### Socio political risks:

There was no visible risk. Working on RE&EE, training locally available experts and workers in the industries would create more jobs and secure the competitiveness of Pakistani industries. In addition, the government of Pakistan has supported RE&EE development and it cannot be foreseen that this would change in a near future.

### Environmental risks:

No environmental risk visible, many RE measure have additional benefits for environment and work forces. The switch to RE reduces local pollution and dust levels, EE efficient equipment produces, in most cases, less emissions (such as noise, heat, vibrations) and is therefore improving health and safety conditions in industries.

- The project sustainability is rated **highly satisfactory**; RE&EE is seen as business opportunity in Pakistan Industries and among consultants and service providers. Payback period for most RE/EE investment is very attractive, upscaling has already started. A 'market' has been created and major project partners have secured funds for continuation of activities.

## 8. Gender mainstreaming

The revised UNIDO Policy on gender equality was issued in March 2015 and the system of "gender marker" was introduced after the project's start and REEE retroactively rated 2A, meaning that the project would pay significant attention to gender and was expected to contribute gender equality<sup>20</sup>.

REEE included initiatives to support women (especially fostering female participation for trainings, output 3.3). As part of project design and objectives, ratio of female participants was monitored and the project document stated several gender related activities and gender strategies.

During project work REEE developed a stronger focus on gender mainstreaming and was successfully working to support female participation in the field of EE, RE and EnMS.

REEE has supported inclusion of female technical experts in the trainings and created an "Award for Best Female Professional in the Energy Sector". The first awarding ceremony took place in August 2022 and brought a lot of visibility and appreciation to women working in the field of EE and RE. The objective of female participation (20%) has been almost achieved in a challenging environment.

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<sup>20</sup> Since 2015 all UNIDO technical assistance projects have been assigned a gender marker and their design are screened based on a gender mainstreaming check-list before approval. UNIDO's gender marker is in line with UN System-wide action plan (SWAP) requirements, with four categories: 0 — no attention to gender, 1 — some/limited attention to gender, 2a — significant attention to gender, 2b — gender is the principal objective (<https://www.unido.org/sites/default/files/files/2019-11/UNIDO%20Gender%20Strategy%20ebook.pdf>)

Moreover 2 training programmes exclusively conducted for Women professionals (with 23 participants) and webinars conducted by women energy experts (via the Energy Desk) on “Energy expert- Promising career for Women” took place.

According to the project brochure, UNIDO “... has broken the glass ceiling ... and advanced gender equality in energy sector ....<sup>21</sup>”. More than 100 women were trained in 20 different trainings; 7 women energy professionals undertook the training on CEM and CEA and 4 women (out of 22 people certified) achieved the first of its kind certification in Pakistan (i.e. female ratio of 18% ).

During the TE mission, ET was able to validate this statement. The female participation in industrial units was visible during onsite visits, they have become part of the EnMS or EE teams in industries and supported the implementations. Several managers in the visited units stated the positive outcome of mixed teams and that without the support of REEE project women would be most likely not be accepted as technical experts.

Energy Award, including the category “Best Female Professional in the Energy Sector” will be conducted annually, ensuring sustainability to support female experts.

In addition, REEE supported 21 women via the National Rural Support Program (NRSP) to improve their livelihood utilizing PVs. This activity was not planned in the design phase, so no target indicator was given.

- The Gender mainstreaming is rated **satisfactory**; the project was rated retrospectively with 2A and could almost achieve the planned target on female participation in trainings, but also gave female experts more visibility and a more equal standing in Pakistan industries

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<sup>21</sup> See brochure on project overview and best practice examples

## IV. Conclusion, Lessons learned, Best practices and Recommendations

### Conclusion

The REEE project was consistent with GEF-5 Climate Change Focal Area Objectives 2 and 3 aiming at promoting market transformation for energy efficiency in industry and the building sector and promoting investments in renewable energy technologies. It promoted the introduction of Energy Management Schemes (EnMS), System Optimization (SO<sup>22</sup>) and selected renewable energy (RE) technologies in industry in Pakistan. This was in line with the priority of the government of Pakistan to reduce GHG emission and explore the possibilities of alternate sources of energy.

The **project was a catalyst for widespread replication of EE and RE initiatives** by the government and private sector through three main project components. UNIDO in pursuit of its goal to support industry on innovative technologies evolved its strategy successfully from selecting few bigger RE companies (considered as demonstration projects) to a relatively large number of beneficiaries with a mix of small and medium enterprises. This change of strategy resulted from the fact that all initially selected large projects backed off from their commitments, either due to financial constraints, change in priority of the management or the change in management itself, or some projects became unfeasible and/or unviable due to fluctuating energy prices and bottlenecks in the availability of energy sources, as in the case of biomass projects.

The project experienced severe delays in the start-up phase and two extensions were needed, one of them was due to Covid lockdowns. These extensions worked in favour of the project and **all results came well in time to feed into policy papers and to support industries during actual energy crisis**. Project outcomes have been utilized to prepare “Alternative Resources for Energy (ARE) Policy 2019” and the “National Energy Efficiency and Conservation EE&C”, 5 Year Action Plan. Multiple best practices could be identified and would have a positive impact on future work in the field of EE and RE.

Overall, **a supportive climate for adaptation of Renewable energy and Energy efficiency measure in Pakistan has emerged** and many stakeholders of REEE are showing high interest in supporting the project activities<sup>23</sup>.

### Lessons learnt

The following lessons can be deduced from actual project documents and discussions and interviews for project stakeholders:

- Inclusion of activities that share information about RE and EE projects in different settings, countries and regions is a fruitful means of promoting best practices and success stories.
- The **training on Certified Energy Manager (CEM) and Certified Energy Auditors (CEA)** organized by the project and conducted by international recognized experts, have been very useful to create awareness in industries and will also ensure sustainability of project results.
- RE technology has to fulfil local requirements and the local climate conditions as such the equipment has to be adapted accordingly. Appropriate and regular monitoring will ensure optimization of the systems by providing more viable operational environment

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<sup>22</sup> Endorsement document used the term System Optimization , during project execution the term Energy Efficiency was used for these activities

<sup>23</sup> When this report was prepared it was not clear whether GEF 7 successor project can be realized, but all stakeholder supported it

which could be ensured through locally available maintenance and service provision by the partners' institutions/ organizations.

- It is learnt that RE&EE works independently from specific industrial sectors; most of the learnings and best practice examples from one sector work as well for many others. The successful implementation of RE&EE practices is a matter of commitment from top management and requires teamwork. Furthermore, implementation of RE&EE and getting much benefits out of it needs behavioural change at all levels e.g., within industries, by policymaker, government bodies and by private sector associations. Creating a pool of trained energy expert in Pakistan enabled this transition, as was envisaged in the project document. This was very much visible in all visited project sites.
- Implementing industries appreciated inputs that trigger and back up the improvement options and support the implementations. The support given by REEE experts helped to select the appropriate solution and to convince the top management to go for the investment. Financial support is seen as add on, but not a must.
- The trainings to become Certified Energy Manager (CEM) and Certified Energy Auditors (CEA) were highly appreciated and outcome on the ground is visible and tangible. Bringing – with help of selected international experts<sup>24</sup> – the awareness and knowledge to Pakistan and train 830+ people is key to secure sustainability. Standardized and internationally recognized trainings have been proved to be very effective components of REEE project, so more related trainings need to be inbuilt in future projects/ programmes.

### Best practices

- **Training courses on EnMS** by bringing international certified consultants and auditors to the local market/ industries, **including local experts** with international qualifications /education for imparting EnMS training, development of specific curricula and conducting thematic studies to improve local expert's capacities will further multiply the perceived benefits from RE/EE technologies. Building locally available capacity is crucial for sustainable use of outcomes. The inclusion of local experts could ensure that studies and trainings really fit to local needs.
- **Combining a New Technology with trainings and awareness activities.** Only when accompanied by creation of local expertise and the abilities to do maintenance (at reasonable costs and within a short timeframe) for new technologies, it will be sustainably successful and able to penetrate the market.
- **Energy Award including Best Female Professional** to create and maintain awareness has been very successful and brought appreciation to those experts working in the field. Furthermore, continuity could be secured by NEECA by bringing it into the upcoming EE&C action plan.
- Including **monitoring and metering (equipment) was an obligatory part** to apply for project grants, this is a great approach. Only proper monitoring enables harvesting and 'appreciation' of results and supports/enables 'non technicians' and top management to go for more investments and even the willingness to take some risks.
- **Bringing Industries and Academia together** as both entities are not well connected. A very positive outcome - and yet another best practice – was the cooperation and joint development, by Fazal Steel and NUST, of a software tool ("EnergEyer") based on IOT and artificial intelligence (AI) to support EnMS and system optimization through real time monitoring.

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<sup>24</sup> The REEE project benefitted from other EE and EnMS projects in Asia in terms of expertise, trainers and training material

- **“EnergEyer” was locally developed;** REEE and cooperation with Fazal Steel supported a start-up to market the same. It got several awards and was named to 1<sup>st</sup> position in Cleantech Innovation Challenge by Ignite Pakistan. The start-up “E-triangle” works now to upgrade EnMS in Pakistani industries from manual calculation-based to fully automate with the help of AI.

### **Recommendations**

1. UNIDO should take care to include informational and awareness-raising activities in future projects, to illustrate best practices and success stories on RE and EE.
2. It is recommended that UNIDO include a communication strategy in its future projects on EE and RE in order to enhance upscaling and replication efforts.



## V. Annexes

### Annex 1: Evaluation matrix

Key evaluation questions	Guiding sub-questions	Means of Measurement	Data Sources
<b>RELEVANCE</b>			
1. How relevant was the project to UNIDO? To target beneficiaries? To the donor?	<ul style="list-style-type: none"> <li>Was the project a technically adequate solution to the development problem?</li> <li>Did the project respond to the cause of the problem?</li> <li>Did the project respond to UNIDO's comparative advantage?</li> </ul>	<ul style="list-style-type: none"> <li>Documented evidence of priority needs for UNIDO, Japan, participating countries and industry stakeholders.</li> <li>Analysis of the project's comparative advantage and feedback from stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Project records on training, # of participants (by gender) and any feedback results</li> <li>Stakeholder &amp; participant Interviews</li> </ul>
2. To what extent was the project suited to the priorities and policies of the target group, recipients, and donor?	<ul style="list-style-type: none"> <li>How did the project fulfil target group needs?</li> <li>To what extent was the project aligned with the development priorities of the countries involved.</li> <li>How did the project reflect donor policies and priorities?</li> <li>Are the original project objectives still valid and pertinent for the target group?</li> </ul>		<ul style="list-style-type: none"> <li>Strategic documents</li> <li>Supervision mission &amp; project reports</li> <li>Government representative interviews</li> <li>UNIDO staff and stakeholder interviews</li> <li>Survey analysis</li> <li>Participant interviews &amp; focus groups</li> </ul>
<b>EFFICIENCY</b>			
3. How economically were resource inputs converted to results?	<ul style="list-style-type: none"> <li>How economically were resources used to produce results?</li> <li>To what extent were expected results achieved within the original budget?</li> <li>What factors impacted the efficiency of achievement of results?</li> <li>Did the project efficiently achieve results compared with alternative approaches?</li> <li>What measures were taken during planning and implementation to ensure efficient use of resources?</li> <li>Was there potential for greater results with the same resource inputs?</li> <li>Were expected inputs from UNIDO and counterparts provided as planned?</li> </ul>		
4. Has the project achieved good value for money?			

Key evaluation questions	Guiding sub-questions	Means of Measurement	Data Sources
5. How timely was the delivery of expected results?	<ul style="list-style-type: none"> <li>To what extent were expected results achieved within the original timeframe?</li> <li>What factors impacted the efficiency of achievement of results?</li> <li>Were project activities in line with scheduling in work plans?</li> </ul>	Timeline review	<ul style="list-style-type: none"> <li>UNIDO documents</li> <li>Project documents</li> <li>Project staff interviews</li> <li>Stakeholder interviews</li> <li>KPI Table</li> </ul>
<b>EFFECTIVENESS</b>			
6. Has the project done things right?	<ul style="list-style-type: none"> <li>What is the quality of results?</li> <li>How do stakeholders perceive results achieved?</li> <li>Are results achieved attributable to the project?</li> <li>Were intended target groups reached by project results?</li> <li>Is there valid evidence of results achieved?</li> </ul>	<ul style="list-style-type: none"> <li>Performance by component, activity &amp; indicators</li> <li>Stakeholder and participant perceptions on performance</li> <li>Field level assessment of targeting</li> <li>Stakeholder and participant perceptions on targeting</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Progress reports &amp; project database</li> <li>Relevant government policies</li> <li>Laboratory documents</li> <li>Industry documents</li> <li>Stakeholder interviews</li> <li>Survey analysis</li> <li>Participant interviews and FGDs</li> </ul>
7. To what extent have the expected results been achieved or are likely to be achieved?	<ul style="list-style-type: none"> <li>For each project component were targets achieved?</li> <li>What are the main results of the project at the output and outcome level?</li> <li>Were different results achieved in different areas? What are the reasons for any variance?</li> </ul>	<ul style="list-style-type: none"> <li>Performance by component, activity &amp; indicators</li> <li>Project staff, stakeholders, and participant feedback on results</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Progress reports &amp; project database</li> <li>Laboratory documents</li> <li>Industry documents</li> <li>Promotional materials</li> <li>Survey analysis</li> <li>Staff and stakeholder interviews</li> </ul>
8. What are the project's key results (outputs, outcome and impact)?			
9. What are the key drivers and barriers to achieve the long-term objectives?	<ul style="list-style-type: none"> <li>What factors have affected the achievement of expected results?</li> <li>What factors have assisted towards the achievement of expected results?</li> </ul>	Project staff, stakeholders, and participant feedback on results	<ul style="list-style-type: none"> <li>Project documents</li> <li>Progress reports &amp; project database</li> <li>Industry documents</li> <li>Survey analysis</li> <li>Staff and stakeholder interviews</li> </ul>
<b>COHERENCE</b>			
10. To what extent was the project aligned with the global development agenda?	<ul style="list-style-type: none"> <li>To what extent was the project aligned with the goals and targets of the 2030 Agenda?</li> <li>To what extent was the project aligned with the principles of the 2030 Agenda?</li> <li>Has the extent of alignment with global agendas changed over time?</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Interviews with project staff</li> </ul>	<ul style="list-style-type: none"> <li>Project design documents</li> <li>Staff and stakeholder interviews</li> </ul>

Key evaluation questions	Guiding sub-questions	Means of Measurement	Data Sources
11. To what extent does the project avoid duplication with other similar interventions?	<ul style="list-style-type: none"> <li>To what extent did the project design acknowledge the work of other development actors in the sector?</li> <li>To what extent did project implementation address gaps in other interventions?</li> </ul>	Document review/Interviews with project staff	<ul style="list-style-type: none"> <li>Project design documents</li> <li>Staff and stakeholder interviews</li> </ul>
<b>PROGRESS TO IMPACT</b>			
12. Are there opportunities for broader impact from project results?	<ul style="list-style-type: none"> <li>To what extent are lessons and results from the project incorporated into broader stakeholder mandates and initiatives?</li> <li>Has institutional change resulted from the project?</li> <li>To what extent are the project's results replicable?</li> </ul> <p>To what extent could the project's approach and results be implemented at a larger scale?</p>	<ul style="list-style-type: none"> <li>Strategic review of context</li> <li>Institutional assessment</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Relevant government policies</li> <li>Staff and stakeholder interviews</li> <li>Survey analysis</li> </ul>
13. What long term effects have been produced by the project?	<ul style="list-style-type: none"> <li>What difference has the project made for beneficiaries?</li> <li>To what extent are changes attributable to project activities?</li> <li>What are the social, economic and environmental effects, either short-, medium- or long-term, on a macro and micro level?</li> </ul>	<ul style="list-style-type: none"> <li>Project outcome indicator performance</li> </ul> <p>Strategic analysis of context for contribution to impact</p>	<ul style="list-style-type: none"> <li>Document review</li> <li>Staff and stakeholder interviews</li> <li>Participant interviews and FGDs</li> <li>Survey analysis</li> </ul>
14. What effects from the project were intended and unintended, both positive and negative?	<ul style="list-style-type: none"> <li>What environmental safeguard effects resulted from the project?</li> <li>What economic performance effects resulted from the project?</li> <li>What social inclusiveness effects resulted from the project?</li> <li>Were any results transformational? What was the key change and causes?</li> <li>Were project assumptions valid?</li> </ul>	Contribution analysis from Theory of Change	<ul style="list-style-type: none"> <li>Project documents</li> <li>Staff and stakeholder interviews</li> <li>Participant interviews and FGDs</li> <li>Survey analysis</li> </ul>
15. To what extent has the project helped put in place the conditions likely to address the drivers, overcome barriers and	<ul style="list-style-type: none"> <li>To what extent has the project contributed to reduced policy barriers?</li> <li>To what extent has the project contributed to the application of new knowledge?</li> <li>To what extent has the project contributed to diversified products?</li> </ul>	Contribution analysis from Theory of Change	<ul style="list-style-type: none"> <li>Project documents</li> <li>Staff and stakeholder interviews</li> <li>Participant interviews and FGDs</li> <li>Government stakeholder interviews</li> </ul>

Key evaluation questions	Guiding sub-questions	Means of Measurement	Data Sources
contribute to the long-term objectives?	<ul style="list-style-type: none"> <li>To what extent has the project contributed to the increased availability of new technology and infrastructure?</li> </ul>		
<b>SUSTAINABILITY</b>			
16. To what extent are the achieved results likely to sustain after project completion?	<ul style="list-style-type: none"> <li>Will project results be sustained after the end of donor funding?</li> <li>Does the project have an exit strategy? How likely is it that this strategy will succeed?</li> <li>To what extent have results and outputs been institutionalized?</li> <li>What is the rate of uptake of new instruments and technologies? Will these rates be sustained/ improved?</li> <li>Have improved systems been incorporated into state budgets?</li> <li>Is adequate staffing and support being applied to continue processes?</li> <li>What progress was made towards the conditions needed to address the long-term objectives?</li> </ul>	<ul style="list-style-type: none"> <li>Institutional assessment</li> <li>Stakeholder feedback on sustainability initiatives</li> <li>Project outcome indicator performance</li> <li>Institutional assessment</li> <li>Stakeholder feedback and documentation on budget allocations</li> <li>Contribution analysis from Theory of Change</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Stakeholder and participant interviews/FGDs</li> <li>Survey analysis</li> <li>Synthesis of data sources</li> </ul>
17. How resilient to risk are project benefits?	<ul style="list-style-type: none"> <li>What is the likelihood of financial and economic resources not being available beyond the end of the project?</li> <li>Are there any social or political risks that may jeopardize the sustainability of project outcomes?</li> <li>Is the level of stakeholder ownership sufficient to allow for the continuation of project benefits and outcomes?</li> <li>Are stakeholders aware of the potential of continuing project benefits?</li> <li>Is there sufficient public and stakeholder awareness of project activities and benefits to support the project's long-term project objectives?</li> <li>Have risk management plans been established, including monitoring actions?</li> </ul>	<ul style="list-style-type: none"> <li>Risk analysis</li> <li>Contribution analysis</li> <li>Stakeholder and participant feedback on ownerships and risks</li> </ul>	<ul style="list-style-type: none"> <li>Synthesis of data sources</li> <li>Stakeholder and participant interviews and focus groups.</li> </ul>

Key evaluation questions	Guiding sub-questions	Means of Measurement	Data Sources
<b>PERFORMANCE OF PARTNERS</b>			
18. What was the quality of implementation?	<ul style="list-style-type: none"> <li>To what extent did project executing entities deliver effectively?</li> <li>How well did the project executing entities identify and manage risks?</li> </ul>	<ul style="list-style-type: none"> <li>Feedback from project staff and donor representatives</li> <li>Document review</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Interviews with project staff</li> <li>Interviews with donor representatives</li> </ul>
19. What was the quality of execution?	<ul style="list-style-type: none"> <li>Were funds used appropriately?</li> <li>How successful was the procurement and contracting of goods and services?</li> </ul>	<ul style="list-style-type: none"> <li>Feedback from project staff and donor representatives</li> <li>Document review</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Interviews with project staff</li> <li>Interviews with donor representatives</li> </ul>
<b>LESSONS LEARNED</b>			
20. What lessons can be drawn from the successful and unsuccessful practices in designing, implementing and managing the project?	<ul style="list-style-type: none"> <li>Has UNIDO and its partners documented and addressed the lessons in potential follow-on activities?</li> <li>Have lessons learned identified during the mid-term review been actioned?</li> </ul>	<ul style="list-style-type: none"> <li>Performance by component, activity &amp; indicators</li> <li>Staff and stakeholder feedback on implementation lessons</li> <li>Project staff, stakeholder and participant feedback on results</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Project staff and stakeholder interviews</li> <li>Survey analysis</li> <li>Synthesis of data sources</li> </ul>

**Annex 2: Progress towards expected results (based on the PLF)**

Expected results	Indicator	Baseline	Terminal Evaluation		Rating	Justification for rating
			Target	Actual		
<p><b>Project Objective</b></p> <p>To reduce energy-related greenhouse gas emissions by facilitating the creation of a market environment to promote the use of RE/EE technologies and measures in the selected industrial sectors of Pakistan.</p>	<p>A. Incremental avoided CO<sub>2</sub>eq. (tonnes of CO<sub>2</sub>eq.)</p>	<p>No direct or indirect emission reduction as a consequence of the project</p>	<p><u>Direct emission reduction:</u> Cumulative reduction of about 2 million tCO<sub>2</sub> over the lifetime of the investments linked with the project in various technologies (of which 1.165 million in RE demos and 0.914 million tCO<sub>2</sub> in improved energy management and systems optimization)</p> <p><u>Indirect emission reduction:</u> Post-project replication (investment in RE/EE opportunities in industry, influenced in part by the project's interventions) will lead to indirect emission reduction of between 12.07-30.9 MtCO<sub>2</sub> (RE) and 2.74-4.35 MtCO<sub>2</sub> (EE)</p>	<p>Direct annual Savings: 7,169 tCO<sub>2</sub>e from PV plants leads to lifetime savings of 143,380 tCO<sub>2</sub>e</p> <p>Annual Savings from EE are 163,238 tCO<sub>2</sub>e</p> <p>Working with the assumption that average lifetime of EE savings is around 10 Years this will lead to a lifetime savings 1,635,000 tCO<sub>2</sub>e</p>		<p>The PMU team monitored the achieved direct emission reduction figures in detail and ET could validate the presented figures. Working with the moderate assumption that savings from EE have an average lifetime of 10 years only, this result in lifetime savings of 1.775 million tCO<sub>2</sub>e.</p> <p>The indirect reduction have not been calculated in detail, but with the main project impacts (proven EE technologies in various show cases, EnMS as core activity to reduce energy bills., B2B Model on PV Plants, Viability of PV for Industries, PV for rural Communities, PPA arrangements in place) and also the fact that the project has trained 830+ people on EE and EnMS it seems realistic that the figure on CO<sub>2</sub></p>

Expected results	Indicator	Baseline	Terminal Evaluation		Rating	Justification for rating
			Target	Actual		
						<p>reductions can be overachieved.</p> <p>ET wants to highlight the fact that savings from EE are 22-fold higher than savings from PV installation.</p> <p>That proves clearly that EE and EnMS has always to be the starting point when working on GHG emission reduction.</p>
<p><b>Outcome 1</b> Policy and regulatory framework on EE/RE use in industry improved</p>	<p>I. Adoption of policy framework supporting RE/EE technologies in industry</p>	<p>Broad RE law in place and tariff determination defined for IPPs (renewables), but no applications yet for solar and biomass. No real incentives for on-site application for RE and EE in industry</p>	<p>Regulations in the existing policy framework are more geared to grid-connected RE projects (other than hydro or wind) and incentives for on-site RE application in industry and EE audits and investments</p>	<p>Study on existing regulations conducted and the main recommendations have been included in the work of the two federal bodies AEDB and NEECA. ARE policy was introduced in 2019 and NEECA policy in 2022 and an EE&amp;C action plan</p>		<p>The first major study on EE any RE Potential and Opportunities in energy-intensive industrial sectors in Pakistan has been conducted and outcome is utilized by concerned stakeholder ET can state that an “enabling environment” has been created. Appropriate tariff related mechanism (e.g. net-metering) are in place and have become a common practice.</p> <p>B2B models to implement PV plants have been introduced and tested, project partners set a benchmark by acquiring</p>

Expected results	Indicator	Baseline	Terminal Evaluation		Rating	Justification for rating
			Target	Actual		
						the first Distributed Generation Licence. At project end 5 companies have a licence now and provide service to industries.
<b>Output 1.1</b> Existing policy and regulatory framework reviewed and recommendations made (including financial and non-financial incentives and instruments)	1) Specific regulations that promote solar and biomass power generation by industry and incentives for EE in industry	RE Law exists	Regulations established within the framework of current RE and power sector legislation that specifically focus on biomass and solar-based power generation in industry (both grid and on-site) and EE incentives through various measures like feed-in-tariffs, soft loans or guarantee schemes, tax rebates or exceptions	Policy review and recommendations reports are in place and utilized		“Policy reviews and recommendations on the promotion of renewable energy and energy efficiency in industries in Pakistan Report” draft published in 2018 and discussed in multi stakeholder verification WS Final version of “REEE Policy Review Advisory Final Report” published and accepted by main stakeholders
<b>Output 1.2</b> Recommendations on improvements in policy and regulatory framework adopted and associated advocacy work	2) Adoption of regulations (see Indicator 1)  3) Number of information events and packages on regulations and policy	N/A  Info on grid-connected tariff formulation for RE IPPs (in practice focusing on hydro, wind)	Regulations promoting RE/EE in industry are adopted by the Government  Information disseminated (amongst decision-makers in government and private sectors, NGOs and banks on the benefits of RE and EE in industry); one package elaborated; about 10 events in various parts of the country	ARE 2019 was put in place utilizing inputs from Policy reports and findings from REEE EE&C Action Plan is under preparation and will be put in place soon Validation WS included 100+ experts		Organized a series of Stakeholders workshops on assessing and aligning the role of Public Actors in developing the national EE and EnMS implementation Strategy The impact of REEEs work on policy and regulation is visible. All stakeholder visited during TE confirmed that



Expected results	Indicator	Baseline	Terminal Evaluation		Rating	Justification for rating
			Target	Actual		
						outputs from the project are useful and utilized. REEE Policy Review Advisory Report discussed and agreed with stakeholders and report was utilized to prepare ARE Policy 2019 and the National EE&C 5 year Action Plan
<b>Output 1.3</b> Sectorial analysis on EE (and RE) opportunities, impact assessment and recommended post-project action plan for RE/EE in industry as well as gender mainstreaming	4) Analysis carried on RE and EE potential in various industrial subsectors with particular attention to project that benefit women.  5) End-of-project impact assessment carried out	ADB-supported studies on EE potential in Pakistan (including industry)  N/A  N/A	Based on ADB-supported analysis, at least 5 such subsector studies are carried out plus a review studies on impacts of realized savings based on earlier NPO/SMEDA work in textile sector  One end-of-project impact study (with recommended actions)  Plan for post-project actions (based on end-of-project impact study) formulated and discussed at workshop(s)	First of its kind Sectorial Analysis in Pakistan on EE and RE including five sector prepared and published The brochure 'Sustainable energy Initiative for Industries in Pakistan' was produced highlighting the project results and impact		REEE 'Sectoral Analysis on Renewable Energy and Energy Efficiency was published in August 2019 and cover Ceramic, Dairy, Foundry, Pulp and Paper and Textile Sector. The Sectoral Analysis is the first of its kind in Pakistan and set a valuable baseline for decision makers and future work in the field The REEE project, has successfully, collected several case studies, best practices, and success stories (videos/reports) on the project progress and performance, from the related stakeholders, from time to time. These case studies and success stories reflect on the REEE project

Expected results	Indicator	Baseline	Terminal Evaluation		Rating	Justification for rating
			Target	Actual		
	6) Action plan for post-project actions					<p>performance / impact in lieu of a formal impact assessment. The result brochure 'Sustainable energy Initiative for Industries in Pakistan – promoting a market environment to stimulate investments in Renewable energy and Energy Efficiency project to avoid GHG emissions' was published.</p> <p>During TE mission in September it was revealed that the REEE project during the remaining time of the project will come up with a plan for post-project actions. The action plan will also make use of the findings of this terminal evaluation, as well.</p>
<b>Outcome 2</b> Investments in RE and EE in pilot demonstration carried out and scaled up	II. Installed capacity of renewable energy and energy generated from renewable energy in industry	Grid-connected IPPs (but few solar or biomass) and no RE captive power applications	Over 11 MW installed biomass and solar technology for on-site and/or grid application with lifetime energy production of 36,722 MWh (biomass) and 7,698 MWh (solar), avoiding 13.54 million GJ of fossil fuels (at	Biomass was dropped due to non-supportive framework; activity was shifted to PV and RE.		Pilot demonstrations could showcase that RE and EE investments in EE/RE are a viable business opportunity and available technologies are fit for Pakistan industries. Local service provider and experts (Energy manager) can

Expected results	Indicator	Baseline	Terminal Evaluation		Rating	Justification for rating
			Target	Actual		
	<p>III. Energy saved by employing EE technologies</p> <p>IV. Direct and post-project direct emission reduction</p>	<p>About 130 audits carried out by NPO and SMEDA up to now; Broad energy potential estimates in studies</p>	<p>total investment of USD 21.5 million)</p> <p>Energy savings of 16.56 million GJ over the technology lifetimes (due to energy management systems and/or systems optimization interventions) at a total initial investment of USD 5.8 million)</p> <p>Resulting direct emission reduction of 1.165 (RE) and 0.914 (EE) million tCO<sub>2</sub>. Full implementation/replication of the two pilots will result to post- project direct emission reduction of 2.86 MtCO<sub>2</sub></p>	<p>18 projects on PV with 12.5MW implemented Multiple projects on PV in the pipeline to be implemented after project period</p> <p>50 Industries developed EnMS plan, formed EE teams and could reduce energy consumption drastically. 11 units certified on EE and ISO 18001. Consultancy and service providing has become a business Opportunity in Pakistan .</p>		<p>support industries with implementation leading to very attractive pay back periods.</p> <p>Scaling up from pilot project to 'mainstream' has already started and will be supported in future by awareness created by REEE project and the experts trained. 50 + companies are working on EnMS and EE and continue to realize energy savings even beyond the project period</p>
<p><b>Output 2.1</b> Projects on EnMS and Systems Optimization (SO) assessed and implemented in industrial companies in</p>	<p>7) Number of plants in which audits/assessment are carried out</p>	<p>NPO has supported out about 73 audits and SMEDA about 42, mainly in</p>	<p>An estimated 130 energy assessment and audits will be carried out, initially in textile sector, but then spreading out in other subsectors (based on analysis in Output 1.3)</p>	<p>Due to lack of funds from main executing Partner NPO it was jointly agreed to skip this activity</p>		<p>Energy Management System implementation programme launched in August 2019 with 50 industrial units participating.</p>

Expected results	Indicator	Baseline	Terminal Evaluation		Rating	Justification for rating
			Target	Actual		
textile (and other sectors)	8) Number of energy management plans implemented (in line with EnMS)  9) Number of plants that implement systems optimization	textile sector. An unknown number has implemented or is about to implement energy management plans and investing in energy improvements	Formulation and implementation of energy management plans in 75 plants (based on energy assessments)  Implementation of systems optimization in 50 plants (based on energy audits mentioned earlier)	A detailed analysis for 50 industries was conducted and EnMS plans developed 11 Industries have completed the ISO 50001 :2018 certification. Other industries are working on the implementation and certification of ISO 50001 and plan it for upcoming period.		In participating industries EE and/or EnMS teams have been established and decision makers are willing to follow their recommendation and opt for investments.
<b>Output 2.2</b> EE and RE technology support in 1 textile unit	10) EE and RE technology supported in a textile company	N/A	Implementation of a 200kW solar PV plant and installation of an energy efficient socks producing line (with state-of-the-art technology and energy saving measures)	Originally planned Unit was dropped due to lack of interest		Activity for Output 2.2 was planned at PPG phase with a specific industrial Unit, but could not be established.  Instead of this specific pilot project, multiple other project in different Units have been successfully installed (see Output 2.3)
<b>Output 2.3</b> RE technologies assessed and implemented in 2 companies	11) Projects for deployment of RE technologies supported (solar, biomass).	N/A	Technical support has been provided to the pilot phase of the biomass power plant (heat and power on site 6MW); and	It was jointly decided to shift project focus towards PV only. At project start the		From the stakeholders' perspective it was correct and efficient to move towards PV. REEE has proven that PV is very much suitable to Pakistani climate

Expected results	Indicator	Baseline	Terminal Evaluation		Rating	Justification for rating
			Target	Actual		
	12) Projects for deployment of RE technologies supported (solar & biomass)		<p>the solar power plant (5MW, grid-connected)</p> <p>Pilot project proponents have (post- project) supported through technical designs and technical services.</p>	<p>frame conditions were not supportive for biomass.</p> <p>18 projects on PV with 12.5MW implemented</p>		<p>conditions and for industries. Net-metering is now in place and a common practice. REEE has supported this first service provider to get Distributed Generation License under NEPRA. PV is now seen as a viable option with a short 'Return on Investment', especially with current energy prices. Multiple successful show cases ensure visibility and replication.</p> <p>Various business model support future PV implementations. Several service providers are very active in the market and according to AEDB around 1.2 GW PV is already installed.</p>
<b>Output 2.4</b> Portfolio of implementation of EnMS/SO and deployment of RE elaborated (incl. finance sources)	13) Portfolio of implementation of EnMS/SO and deployment of RE elaborated (incl. finance sources) and focus on industries the benefit women.	N/A	List of EE and RE investment opportunities (elaborated based on activities of outputs 1.3 and 2.4) and, if needed, finance sources are identified and financial engineering supported (see output 3.1)	Service provider and investment opportunity list is available on Energy Desk website.		See output 3.1.

Expected results	Indicator	Baseline	Terminal Evaluation		Rating	Justification for rating
			Target	Actual		
<p><b>Outcome 3</b> Investment platform for scaling up investments operational; Training centres operational and programmes established; Monitoring of results and knowledge disseminated</p>	<p>V. Institutional capacity strengthened for scaling-up of RE and EE in industry</p> <p>VI. Finance for RE/EE mobilized</p> <p>VII. Knowledge on RE/EE in industry disseminated</p>	<p>Organizations such as NPO, SMEDA, ENERCON provide some services, training and advice on EE</p>	<p>Windows in non-energy organizations (NPO, SMEDA) established (or strengthened in other organizations that promote energy-related investments (RE/EE) in industrial companies, in particular SMEs</p> <p>Strengthened 'Training and Certification Centre'</p> <p>Establishment of training institute for textile subsector supported</p> <p>Formulation of financial packages for RE/EE investments with national financial companies (number, amount, type of finance)</p> <p>Awareness raising campaigns carried out; info packages formulated and disseminated; 'best practice' knowledge captured and disseminated</p>	<p>The one-stop energy Desk is run by SMEDA and funding to maintain it is secured beyond funded project period. Industrial Units are utilizing it.</p> <p>Trained CEE and CEA Experts are either working in companies (forming energy teams) or in consultancies. A market for EE and EnMS consultancy has been established</p> <p>Energy Performance Awards successfully conducted in 2022 and to be continued in upcoming Years</p>		<p>All but one component (see output 3.2) have been successfully conducted and will support industries in Pakistan to invest into RE and EE beyond the project period.</p> <p>Highly motivated and well-trained energy experts support companies to improve their energy efficiency.</p> <p>The Energy Award will ensure that awareness on the RE, EE and EnMS is growing and will sustain.</p>

Expected results	Indicator	Baseline	Terminal Evaluation		Rating	Justification for rating
			Target	Actual		
<b>Output 3.1</b> Investment platform to promote RE and EE in industrial companies strengthened (non-grant instruments, banking products; awareness creation)	14) Strengthened 'energy desks' at Pakistani organization that provide info services	Organizations (such as NPO, SMEDA) provide some services, technical training, informational advice on EE	Strengthened 'energy desks' and services delivered (audits support, best practices, grant and non-grant instruments, finance sources) on EE/RE for industry (NPO; SMEDA, associations)	The one-stop energy Desk is in place functioning run by SMEDA and utilized by industries. Number of visitors and support given is monitored by SMEDA		The Energy Desk was developed and put in place (testing phase) in 2021, official Launch event was done with Energy Awarding event in August 2022. SMEDA is running it and funds are secured beyond REEE Project. Contact and requests are monitored and SMEDA ensure feedback and ongoing support
<b>Output 3.2</b> Training and Certification Centre and Textile Training Facility for experts on RE and EE- EnMs applications established (under NPO) and training and accreditation programme established	15) Certification centre for experts on EE/RE applications established  16) Training centre for textile industry supported	N/A	Strengthened 'Training and Certification Centre' at NPO  Establishment of training facility for textile subsector supported	This activity was dropped (See Output 2.1)		N/A
<b>Output 3.3</b> Training of experts on EE and RE in industrial applications carried out with at least 20% being women.	17) Number of experts trained on RE and EE - EnMS/SO applications in industry with at least 20% being women.	Limited training is provided by NPO/SMEDA	At least 120 experts trained and certified	Enhanced trainings overachieved the targeted numbers by far (830+ participants, 100+ female)		Selection of trainers and trainees was very successful and led to 20+ different training and supported around 625 trained professional and 22 ISO 50001 accredited

Expected results	Indicator	Baseline	Terminal Evaluation		Rating	Justification for rating
			Target	Actual		
						professionals (18% women). They supported the 50 industrial units towards EE and EnMS
<b>Output 3.4</b> National Energy Performance Award scheme introduced	18) Award scheme for energy performance in large companies and SMEs	N/A	Award scheme for energy performance in large companies and SMEs and 'awards' provided on an annual basis with associated publicity	Energy Performance Awards in Industries is on place and functioning		The award was introduced with 4 categories (including Best women professional in the Energy Sector) in 2021 and first awarding ceremony was held in August 2022 successfully. NEECA ensures that Energy Awards will be an annual practice and is part of the EE&C action plan.
<b>Output 4.1</b> Project monitoring and evaluation, knowledge dissemination	19) Evaluations mandatory under GEF and UNIDO rules carried out 20) Experiences and knowledge created by the project captured and disseminated	N/A	One mid-term evaluation and one final (terminal) evaluation  Regular reporting on project website; Publication on best practices and experiences	Both conducted  Done		Mid Term Review conducted in March 2019 by Mr Muhammad Abbas Khan. TE conducted in September 2022. Recommendations from MTR have been followed by PMU wherever within their influence.  Publications available, the final brochure also highlights Best Practices. Energy desk is functioning and utilized by industries.





### Annex 3: List of documents reviewed<sup>25</sup>

1. **Project Document endorsement 100045 signed 20<sup>th</sup> Feb 2014**
2. **UNIDO open source data:** <https://open.unido.org/projects/PK/projects/100045>.
3. **Annual Project Reports (PIR) 2017 -2021**
4. **Annual Progress Reports (2016 - 2019)**
5. **Project Steering Committee Meetings (2016 - 2021)**
6. **Supporting Documents;** *Inception report, ???; Impact assessment report, April 2020; Terminal Report ???, Grant and Co-financing data for RE, Co- financing total, July 2022*
7. **Dissemination material:** Project brochure UNIDO, 2022; SEIP fact sheet, UNIDO 2022
8. **Mid-Term Review Report;** Muhammad Abbas Khan, March 2019

#### **Component 1 – Develop Policy and regulatory framework**

Policy Review Report – first Progress Report, Full Advantage Co (Thailand) and Pitco Private LTD (Pakistan), Oct 2016  
Report on Stakeholder Consultation Meetings (draft), Full Advantage Co and Pitco Private LTD, Nov 2016  
REEE Policy\_Review Advisory Final Report Vol 1; ), Full Advantage Co and Pitco Private LTD, Dec 2017  
Energy Optimization in Industry, Sectoral Analysis Report, UNIDO Pakistan; July 2019

#### **Component 2 – Investment in RE and EE industry**

##### **2.1 Projects on EnMS and SO**

##### **2.2 EE and RE technology support**

##### **2.3 EE and RE technology implementation**

Supporting documents for RFPs, contract templates,, Bidder access guide

##### **2.4. Portfolio of Implementation**

#### **Component 3 – Create Platform for promoting investment and sustainability**

##### **3.1. Investment platform to promote RE and EE-Energy**

Desk First Progress Report, SMEDA June 2021, Visibility Material  
UNDIO - PFAN (TORs and Image brochure)  
Concept Paper - Energy Desk (UNIDO REEE) Final  
webpage; <https://energydesk.smeda.org/>, visited 10.8.2022

##### **3.2. Certification center and textile training facility for experts**

MOU UNIDO and NUST, June 2018  
Meeting minutes with AEE and AEE formation meetings, July/August 2018

##### **3.3. Training of experts on EE and RE**

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<sup>25</sup> All documents have been prepared by PMU and all files stored in <https://xfiles.unido.org/> and access was given well in time before country mission.

### **3.4. National Energy Performance Award scheme**

Invite for Awarding ceremony, UNIDO Aug 2022

Criteria and selection/application documents, UNIDO 2021

#### **Component 4 – Monitoring and Evaluation**

See previous page

#### **Evaluation information:**

- UNIDO Evaluation Policy (May 2015)
- UNIDO gender policy. April 2009
- DAC Evaluation Quality Standards (2006)
- DAC Glossary of Key Terms in Evaluation and Results Based Management (2002)

**Annex 4: List of persons interviewed / met**

S. No	Mr./ Ms.	Name	Designation	Organization/ industrial unit	Group meeting: Date/ time of meeting
<b>Sindh Karachi - Meetings</b>					
1	Ms.	Saba Iqbal	Director	Meeting/ site visit - Artistic Fabric Mill. Renewable Energy & ISO 50001 Certification - 472 Deh, Landhi Town, Karachi	Wednesday, July 31, 2022 09.00 pm to 01:00 pm
2	Ms.	Asma Omar	CSR Strategy Manager		
3	Mr.	Ameer Hussain Thebo	Chief HR & Compliance Officer		
4	Mr.	Agha Nadeem	Technical Director		
5	Mr.	Shahiduddin	General Manager		
6	Mr.	Naveed Afzal	Chief Operating Officer		
7	Mr.	Ameer	Group Chief officer		
8	Mr.	Jamshed	Group Utilities GM		
9	Mr.	Sajid	Asst. Electrical manager		
10	Mr.	Imran	Senior Utility Manager		
11	Mr.	Sajjad	AM Electrical		
12	Mr.	Amir Zain	Asst. Manager Energy & Environment		
13	Mr.	Muhammad Usman	Maintenance Engineer		
14	Ms.	Urooj Ishaque	Maintenance Engineer		
15	Mr.	Talal Ahmed	Maintenance Engineer		

S. No	Mr./ Ms.	Name	Designation	Organization/ industrial unit	Group meeting: Date/ time of meeting
16	Mr.	Mr. Muhammad Yamin Khan	Group Maintenance Manager	Meeting/ site visit - Dawlance Industries - Renewable Energy & ISO 50001 Certification - D-89, Deh Khanto Main National Highway Landhi Karachi.	Wednesday, July 31, 2022 3.00 pm to 5:00 pm
17	Mr.	Mr. Ihsan	Engineer		
18	Ms.	Ms. Ayesha	Engineer		
19	Mr.	Mr. Tasawar Iqbal	Sr. Engineer/ Plants manufacturing activities		
20	Mr.	Mohammad Yameen Khan	Group Maintenance Manager		
21	Mr.	Mr. Mehmood Ahmed	Director	Meeting/ site visit - Ebrahim Textile - Energy Optimization/ ISO 50001 Certification - HX-2, Zone-2, KDA Sch 4, Landhi Town, Karachi, Karachi City	Thursday, September 01, 2022 10.00 pm to 2:00 pm
22	Mr.	Mr. Aqeel Mohsin	General Manager Engineering		
23	Mr.	Zakir Ahmed	G.M Quality		
24	Mr.	Anees Abbas	Senior Manager PD & Mill Utilities		
25	Mr.	Atif Ahmed Khan	Principal Consultant	Meeting with Arch Associate, Local Consultant, EnMS implementation, B-217, Street 13, Block L North Nazimabad	Thursday, September 01, 2022 3.00 pm to 5:00 pm
<b>Punjab Lahore - Meetings</b>					
26	Mr.	Irteza Ubaid	Head Business Development		Friday, September 02, 2022

S. No	Mr./ Ms.	Name	Designation	Organization/ industrial unit	Group meeting: Date/ time of meeting
27	Mr.	Muhammad Imran Malik	Sr. Vice President Business Development	Meeting with Shams Power - Renewable Energy - 2nd Floor, Al-Maalik Plaza, 19 Davis Road, Garhi Shahu, Lahore	3.00 pm to 5:00 pm
28	Mr.	Ahsan Suhail Mannan	Director	Site visit to EMCO Industries - Renewable Energy, Energy Optimization/ ISO 50001 Certification - 19KM Lahore-Sheikhupura Road, Lahore	Monday, September 05, 2022 11.00 pm to 2:00 pm
29	Mr.	Rizwan Aslam	General Manager (Plant)		
30	Mr.	Farhad Ali Amjad	Assistant Manager (Electrical)		
31	Mr.	Sultan Ahmed Din	G.M Plant & Operations	Sabir Poultry, Renewable Energy, 10 Km off Sheikhupura-Faisalabad Road, 1.5 K.m off, Kharianwala, District Sheikhupura	Monday, September 05, 2022 3.00 pm to 5:00 pm
32	Mr.	Abdul Moez Tariq	Deputy Manager Maintenance		
33	Mr.	Ashfaq Ahmed	General Manager	Small & Medium Enterprises Development Authority (SMEDA), Egerton Road Lahore	Tuesday, September 06, 2022 3.00 pm to 5:00 pm
34	Mr.	Fouzan Muhammad	Deputy General Manager		
35	Mr.	Haroon	Energy Support officer		
36	Mr.	Haider Arshed	Electrical Engineer		
37	Mr.	Mubeen	Electrical Engineer		

S. No	Mr./ Ms.	Name	Designation	Organization/ industrial unit	Group meeting: Date/ time of meeting
38	Mr.	M. Saeed Aslam	Executive Director	Iqbal Rice Mills (Pvt.) Ltd. Faisal Abad Road, Chiniot.	Group meeting - Wednesday, September 07, 2022 10:30am - 01:30pm
39	Mr.	Nauman	Chartered Accountant		
40	Mr.	Ahsan Bajwa	Engineer		
41	Mr.	Shafiq	Compliance Manager		
<b>Islamabad - Meetings</b>					
42	Mr.	Aftab	Deputy Director	National Productivity Organization NPO - Shaheed-i-Millat secretariate Islamabad	Group meeting - Thursday, September 8, 2022, 09:30am - 10:30am
43	Mr.	Saadullah Aziz malik	Executive Director	Fazal Steel - Industrial Area Islamabad	Group meeting - Thursday, September 8, 2022, 11:30am - 01:30pm
44	Mr.	Mohsin	Electrical Engineer		
45	Mr.	Bilal	Industrial Engineer		
46	Mr.	Jehad Saleh Khan	NUST - Project Manager/ Co-founder Research Programme		
47	Mr.	Nisar A. Latif	Chairman	UNIDO Office Renewable Energy Association of Pakistan	Group meeting - Thursday, September 8, 2022, 03:30pm - 05:30pm
48	Mr.	Mir Ahmed Shah	General Secretary		
49	Ms.	Saja Moez	Engineer / Project Manager		
50	Mr.	Syed Aqeel Hussain Jafri	Director (Policy)	AEDB; AEDB office OPF Building, G-5/2, Islamabd	Group meeting, Friday September 9, 9:30 - 10:45

S. No	Mr./ Ms.	Name	Designation	Organization/ industrial unit	Group meeting: Date/ time of meeting
51	Mr.	Sabieh Haider	Policy - Director	NEECA, NEECA office building, G-5/2 G-5, Islamabad, Islamabad Capital Territory	Group meeting - Friday September 9, 11:00 - 12:15
52	Ms.	Saima	Communication Expert	NEECA	
53	Mr.	Salman Masood	Deputy Secretary	MOIP	Civil Secretariat Islamabad
54	Ms.	Madiha	Section Officer	MOIP	Civil Secretariat Islamabad
55	Mr.	Dr. Zaigham Abbas	Deputy Director Chemical/ NPC	MOCC	Group meeting - Sept. 12, 2022:14:00
56	Ms.	Bushra	Coordination Consultant	MOCC, LG&RD Complex, Sector G-5/2, Islamabad	
<b>UNIDO team met</b>					
57	Ms.	Adot Killmeyer- Oleche	UNIDO, Senior Evaluation Officer; Independent Evaluation Unit,	UNIDO HQ, 1400 Wien, Austria	In person meeting 29 <sup>th</sup> June 11:00 Online meeting 1 <sup>st</sup> July 12:00
58	Ms.	Nadia Aftab	Unido Country Representative	UNIDO Pakistan UNIDO Office - Serena business Complex, Islamabad	Online meeting 1 <sup>st</sup> July 12:00 and September 8, 14:00
59	Mr.	Masroor Ahmed Khan	UNIDO Project manager	UNIDO Pakistan	Accompanied the TE mission from 30 <sup>th</sup> August to 14 <sup>th</sup> September
60	Ms.	Amina Nasim Khan	UNIDO Communication Expert	UNIDO Pakistan	In person meetings on September 12, 13 & 14, 2022
61	Mr.	Fahad Ali, Chaudhary	UNIDO Renewable Energy Expert	UNIDO Pakistan	



S. No	Mr./ Ms.	Name	Designation	Organization/ industrial unit	Group meeting: Date/ time of meeting
62	Ms.	Thuy Thu Le	UNIDO, Senior Evaluation Officer; Independent Evaluation Unit	UNIDO HQ, 1400 Wien, Austria	Several online meetings in October
63	Mr.	Alois Mhlanga	UNIDO HQ, Senior Project Manager	UNIDO HQ, 1400 Wien, Austria	Online meeting; 20.10
<b>Online meetings with REEE projects' consultants</b>			UNIDO, Senior Evaluation Officer; Independent Evaluation Unit,		
64	Mr.	Gerard Doherty	International Consultant - UNIDO Consultant for REEE Project		Online meeting - Friday, September 9, 2022, 01:00 pm - 01:30pm
65	Mr.	Erik Gudbjerg	International Consultant - UNIDO Consultant for REEE Project		Online meeting - Monday, September 12, 2022, 04:00 pm - 04:30pm
66	Mr.	Albert Williams	International Consultant - UNIDO Consultant for REEE Project		Online meeting - Monday, September 12, 2022, 04:30 pm - 05:00pm

## **Annex 5: GEF result indicator / Tracking table**

### **Updated Monitoring and Assessment tool of core indicators:**

As the project saw drastic changes at the starting point on the ground, the 2 tables from the endorsement document were not utilized to track the data. Due to the ground situation, that the originally planned industries (as per the endorsement document) lost interest, focus shifted from Biomass (not viable in 2014/15 in Pakistan) towards PV and from 3 main investments to around 20 smaller ones and support to rural communities (through NRSP) was given. This change led to more showcases proving the viability of this technology for multiple industries and regions and also in the rural context.

Instead of the original tracking table different tools to monitor the savings from EE activities and the implementation of PV systems, have been utilized. The actual results – at the time of TE mission in Pakistan – have been crosschecked and are reasonable. The table for installed PV capacity shows only the projects that have been ‘directly installed under REEE (with technical and financial support from the project). The project not only enabled the first business B2B models to install, but also supported the establishment of the ‘net-metering’ concept in Pakistan. It is visible that the REEE triggered an enormous push for the installment of PV – system in industries, several suppliers offer B2B solution in the country.

**Table 1:** Emission reduction from energy savings measures and technologies (excerpt from Prodoc, 2014)

Activity	Aver. investment (USD)	Number of projects	Total investment (USD)	Annual power savings (MWh)	Annual fuel savings (GJ)	Assumed lifetime (yrs)	GHG savings (tCO <sub>2</sub> ) (annually)	GHG savings (tCO <sub>2</sub> ) (cumulative)
Implementation of EM plans	7,500	75	562,500	41,250	495,000	15	27,225	408,375
Assessments	13,000	130	1,690,000			10		
System optimizations	50,000	50	2,500,000	75,000	900,000	10	49,500	495,000
Grand total			4,752,500	116,250	1,395,000		76,725	903,375

**Table 2:** Actual emission reduction from energy savings measures and technologies (date September 2022), prepared by UNIDO PMU

	Items	Units	Units saved	annual Saved Units	kWh Equivalent	GHG Savings (tCO <sub>2</sub> e)	Total implementation cost of EEM (Mio -PKR)	Net Savings after EEM (Mio-PKR/yr)
1)	Steam Savings	(kg)	19,842,599	238,111,188	79.370.396	13.704	125.61	254.29
2)	Electrical Savings	(kwh)	12,042,271	144,507,252	144.507.252	65.530	1,663.18	1,792
3)	Natural Gas Savings	(m3)	3,441,179	41,294,148	424.412.077	83.524	542.70	4,133
4)	Compressed Air Savings	(m3)	14,818,403	177,820,836	1.046.005	480	85.07	280
	Total			601,733,424	649.335.730	163,238	2,417	6,460
						<b>Total Savings in Mio USD</b>	14,299 <sup>26</sup>	38,222

Table 2, shows that as a result, savings from EE measures have been more than doubled and the investments have been achieved threefold, compared to the original plans (highlighted in Yellow).

<sup>26</sup> This figure shows the conversion from PKR to USD. The conversion rate taken as an average from 2019 to 2022 (i.e. 169), where most of the investments have been made!

**Table 3:** Tracking tool – Cost effectiveness for RE and EE and total from endorsement document (Project Document endorsement 100045; 20th Feb 2014)

	RE	EE	Total		Comments
Installed capacity					
- biomass	12			MWe	
- solar PV	50.2			MWe	
Lifetime energy production					
- biomass	73,444			MWh	
- solar PV	74,318			MWh GJ	
Lifetime fuel avoided or saved				tCO2	GEF USD/tCO2 0.72
Direct emission		16,562,700		tCO2	Replication factor ( 3
reduction (cumul)	4,023,557	914,423	4,937,980	tCO2	See explanation below
Indirect (bottom-up)	12,070,672	2,743,268	14,813,939		
Indirect (top-down)	30,911,495	4,346,629	35,258,124		
Calculation indirect (top-down)					
EE	Potential savings 2019, industry		98,411,709 GJ/yr		Source: ADB TA-7060 PAK (2009)
			78,729,367 GJ/yr		Causality factor (CF 80% share RE
RE	Penetration 2020, biomass+PV		25,000,000 MWh/yr		in electricity in 2020
			3,300,000 MWh/yr		share PV and biomass in 2020
			1,419,000 MWh/yr		share industry + bi 43%
			1,135,200 MWh/yr		Causality factor (CF 80%
					Source: ADB TA-488 (2009)

The **actual installed capacity** – with direct support from REEE – **is 12.5 MW** (see table 4, next page)! The PV capacity installed in Pakistan, that was triggered through showcasing the viability and development of the business model, but not under control of PMU is not monitored. As an example, Shams Power has in total installed 27MW under the jointly developed B2B business model!



**Table 4:** Actual emission reduction from installed PV systems (date September 2022), prepared by UNIDO PMU

Site/Location.	PV Plant DC Capacity (kWp)	Simulated First Year Generation (kWh)	GHG savings			Site/Location.	PV Plant DC Capacity (kWp)	Simulated First Year Generation (kWh)	GHG savings
Al-Maalik Building	79,56	82.308	37			EMCO	983	1.423.000	711
Metro Model Town Store	252,45	269.228	122			Sabir's Poultry	1.700	2.406.000	1.091
Metro Safari	454,74	511.543	232			Ebrahim textile	250	378.000	170
Akzo Nobel Pakistan Limited	447,48	467.253	212						
METRO Cash and Carry Thokar, Lahore	396,00	403.511	183			Site/Location.	PV Plant DC Capacity (kWp)	Simulated First Year Generation (kWh)	GHG savings
METRO Cash and Carry, Islamabad	360,00	358.294	162			Artistic Fabrics Mills	800	1.161.000	527
Metro DHA Lahore	356,00	419.664	190			Shams Power - Nishat Hyundai	1.000	1.402.000	636
Packages Mall	1.897,00	2.117.154	960			Iqbal Rice	1.000	1.468.000	666
Metro Multan	175,00	227.749	103			Gateron Industries	400		
Maxim Khanewal	474,00	585.858	266			Site/Location.	PV Plant DC Capacity (kWp)	Simulated First Year Generation (kWh)	GHG savings
Metro Ravi	140,40	162.599	74			NRSP	1.318	1.825.000	828
	5.033	5.605.161	2.542				7.451	10.063.000	4.628

Site/Location.	PV Plant DC Capacity (kWp)	Simulated First Year Generation (kWh)	GHG savings		Site/Location.	PV Plant DC Capacity (kWp)	Simulated First Year Generation (kWh)	GHG savings
		Total installed RE Capacity					12.484 MW	
		Total Units Generated /year					15.67GWh	
		Total GHG saving / year					7,169 t CO2e	
		Total GHG saving over investment period - 20 years					143,380 t CO2e	

**Annex 6: Evaluation Terms of Reference**



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

**TERMS OF REFERENCE**

**Independent technical evaluation of the project**

**Sustainable Energy Initiative for Industries in Pakistan**

**UNIDO ID: 10054  
GEF Project ID: 4753**



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Annex 1: Project Logical Framework

Annex 2: Detailed questions to assess evaluation criteria:

See Annex 2 of the UNIDO Evaluation Manual

Annex 3- Outline of an in-depth project evaluation report

Annex 4: Checklist on evaluation report quality

Annex 5: Guidance on integrating gender in evaluations of UNIDO projects and Projects

Table 1. Project evaluation criteria

Table 2. Project rating criteria

Table 3. Tentative timelines

## I. Project background and context

### 1. Project factsheet

Project title	Sustainable Energy Initiative for Industries in Pakistan
UNIDOID	10054
GEF Project ID	4753
Region	Asia Pacific
Country(ies)	Pakistan
Project donor(s)	GEF
Project implementation start date	June 01, 2014
Expected duration at project approval	48 months
Expected implementation end date	June 30, 2022
GEF Focal Areas and Operational Project	CCM, Climate Change, CCM2, CCM3
Implementing agency(ies)	UNIDO
Executing Partners	AEDB, SMEDA, NPO, NEECA
Donor funding	USD 3.550 Million
Project GEF CEO endorsement / approval date	April 02, 2014
UNIDO input (USD)	
Co-financing at CEO Endorsement, as applicable	USD 31,200,000
Total project cost (USD), excluding support costs and PPG	3,381,375
Planned terminal evaluation date	TBD

(Source: Project document, PIR 2020-2021)

### 2. Project context

The power situation in Pakistan is characterized by an increasingly widening gap between demand and supply and has recently been described as reaching a crisis level with the recognition that no quick solutions are possible. The order of magnitude of unmet demand in peak demand months is over 25% of and rising. This situation adversely affects the economy and the general well-being of Pakistan. The lack of power is compounded by high transmission losses of around 30%. These include technical (poor quality infrastructure) and non-technical (theft and non-payment due to poor bill collection) losses as well as 'circular debt'. Many companies have difficulties in accessing modern energy services due to frequent electricity supply interruption. This affects small and medium-sized enterprises (SMEs) which often have to resort to using expensive diesel generator sets. The power shortage and interruptions result in a lowering of the industrial production, profit, capacity, and growth. The Government of Pakistan has launched various initiatives to promote energy efficiency and the use of alternative and renewable energy in the country. These initiatives have achieved varied results so far. Because of frequent power interruptions, industries have resorted to setting up natural gas and fossil-fueled captive power plants to meet their energy needs. At the national level, the government is forced to address competing needs for power and attempt to balance gas supply

for industries and transportation with gas supply for the domestic sector. Thus, the Government started natural gas rationing for companies and in some cases, quotas have been fixed for supplying gas to the industries. This has interrupted the gas supplies to industries and not allowed them to run their captive power plants for power generation. In most cases, companies are forced to run their captive power plants on diesel, thereby increasing production costs. The energy shortage results in a lowering of their production, profit, capacities, and opportunities to grow.

The Renewable Energy Law (2006) provides for the promotion of Independent Power Producers running renewable energy systems. In terms of overall impact, however, the share of renewable energy in the total mix (apart from large-scale hydropower) remains small. The total installed capacity of all different renewable technologies in Pakistan was 41.5 MW as of July 2010 (excluding large-scale hydro). Various private sector investors have made progress in terms of the development of wind energy and hydropower projects over 2010-12 (preparation of feasibility studies; over 20 companies have submitted their tariff petition to NEPRA). In contrast, there are only a few requests up to now for solar energy and biomass. Solar applications remain largely restricted to off-grid applications (e.g., solar home systems) and solar water heating.

Given the availability of the biomass, organic waste, and agriculture waste and the abundant solar energy, power generation from renewables seem to offer a solution; first, to meet domestic electricity needs of both large companies and SMEs (in addition the grid can deliver), but also to become independent power producers (IPPs) and sell (surplus) energy to the grid.

SMEs, including household manufacturing industries, significantly contribute to Pakistan's economy as demonstrated by the fact that 90% of all enterprises in Pakistan are SMEs, employing 80% of the non-agricultural labour force and contributing 40% to GDP. In rural areas, there are over 290,000 established SMEs that are involved in diverse activities including tobacco curing, *gur* making, blacksmithing, lime manufacture, pottery, rural bakeries, etc. These SMEs are viewed as the engine for industrial development and growth of rural Pakistan thereby contributing significantly to poverty reduction and employment creation. The Government of Pakistan's economic survey of 1998-99 showed that SMEs with a mere 20% investment (and with access less than 10% to total formal credit supply) generated 80% of the country's total employment.

Although data on the overall energy consumption in SMEs is not readily available, targeted surveys covering specific regions have shown that most SMEs depend on fossil fuel or wood-based heat and electricity. Many SMEs use large amounts of process heat as part of their industrial operations. Given the readily available biomass resource in rural areas, including organic waste and agriculture waste, biomass gasification seems to be an ideal solution to meet the electricity and heat needs of these SMEs. Penetration of biomass energy technology in energy-intensive SMEs of Pakistan will help SMEs to lower their electricity bills and 24/7 smooth running of their industrial operations without any load shedding.

Enterprises have not implemented EE and RE programs despite the large potential for improvements and locally available RE resources. Several initiatives have been launched by the government. However, several barriers remain that contribute to the slow and failure of the uptake of EE measures in industry and implementation of industrial RE applications.

First, we note that there are policies on energy efficiency (EE) and renewable energy (RE). Despite awareness creation efforts initiated by the government in the area of RE and EE, little achievement has been achieved by way of real investments in the energy sector due to several interrelated barriers. Implementation has been slow due to limited capacity and perceived lack of access to appropriate financial resources. The EE programs and initiatives in the country have not been delivered up to now and there is still a need for comprehensive capacity building

focused on the industrial sector. Lack of operating, calibrated energy measuring instruments and absence of forms and records of the end of consumption add to the awareness problem at the plant level. Training materials and application manuals, developed in other countries may not address problems and issues specified in the Pakistan industry. The absence of national codes and standards for energy consumption as well as energy benchmarking for energy utilization efficiency in industrial processes limits the market. There is no real incentive or rebate policy offered for energy conservation projects in the industry. As a result, there are limited penetration of energy-efficient measures, alternative energy technologies, and energy management systems in the industry.

Based on the observed situation, it is likely that energy consumption and GHG emissions will continue to increase in the industrial sector if the business-as-usual scenario persists. Without the GEF project, EE and RE technologies and approaches will not be used extensively by companies until the technical and commercial viability of doing so is proven in selected clusters, such as the textile sector. Sources of external assistance to the energy sector have so far been ADB, World Bank (WB), UNDP, Germany (GIZ), and Japan. Assistance from ADB and WB has been directed to the power and gas sector restructuring. Regarding industry, GIZ and SMEDA have implemented various EE activities (raising awareness on EE; facilitating industrial energy audits; instituting training on EE including training activities) and building the capacity of local consultants and ESCOs), starting with the textile sector. The GEF project will build on these energy EE activities initiated by NPO, SMEDA, and supported by GIZ.

This project seeks to address the before-mentioned barriers related to the policy, incentives for the development of the robust domestic market for delivering technology and management solutions, and an enhanced policy and regulatory framework for the promotion of RE and EE measures in the industry. An integrated and holistic approach that combines demonstration projects that have high replication potential with interventions that seek to establish a market environment conducive to investments in clean energy practices and technologies will be adopted.

### 3. Project objective and expected outcomes

The outputs and activities under each component are detailed below.

<b>Project objective:</b> To reduce energy-related greenhouse gas emissions by facilitating the creation of a market environment to promote the use of RE/EE technologies and measures in the selected industrial sectors of Pakistan.		
<b>Project Components</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>
1. Develop policy and regulatory framework to support the uptake of EE and RE in the industry	Conducive policy and regulatory framework established.	1.1 Existing policy and regulatory framework reviewed and recommendations made (including financial and non-financial incentives and instruments)
		1.2 Recommendations on improvements in policy and regulatory framework adopted and associated advocacy work
		1.3 Sectoral analysis on EE and RE opportunities, impact assessment and recommended post-project action plan for RE/EE in the industry paying special attention to industries that benefit women
2. Investments in RE and EE in the industry	Investments in RE and EE in pilot demonstration carried out and scaled up	2.1 Projects on EnMS and Systems Optimization (SO) assessed and implemented in industrial companies in textile (and other sectors)
		2.2 EE and RE technology support in 1 textile unit
		2.3 Projects for the deployment of RE technologies assessed and implemented in 2 companies
		2.4 Portfolio of implementation of EnMS/SO and deployment of RE elaborated (incl. finance sources identified) with particular attention to projects that benefit women.
3. Create a platform for promoting investment and sustainability	Investment platform for scaling up investments operational	3.1 Investment platform to promote RE and EE in industrial companies strengthened (non-grant instruments, banking products; awareness creation)
		3.2 Certification center and textile training facility for experts on RE and EE-EnMS

**Project objective:** To reduce energy-related greenhouse gas emissions by facilitating the creation of a market environment to promote the use of RE/EE technologies and measures in the selected industrial sectors of Pakistan.

Project Components	Expected Outcomes	Expected Outputs
		applications established (under NPO) and training and certification program established paying particular attention to gender mainstreaming
		3.3 Training of experts on EE and RE in industrial applications carried out, with at least 20% being women.
		3.4 National Energy Performance Award scheme introduced
4. Monitoring and evaluation	Monitoring of results and knowledge disseminated	4.1 Project monitoring and evaluation, knowledge dissemination to include regular reporting, mid-term and terminal evaluation undertaken

#### 4. Project Implementation and arrangements

##### A. *Stakeholder involvement and institutional set-up:*

##### 1) Key stakeholders involved in the project and their respective role

The two key implementing agencies in Components 2 and 3 were:

- **National Productivity Organization (NPO):** NPO, under the aegis of the Ministry of Industries and Production, works as a Liaison Officer of the Asian Productivity Organization (APO) for the promotion of “productivity & quality” in various sectors of the economy. To date, various energy audits have been conducted, mainly in the textile sector, some in the steel sector, and other sectors (including public buildings). NPO has developed the Industrial Sector Management Information System. The system calculates the energy consumed per unit production of the particular industry. The system also helps to identify the energy consumption of local industries and benchmark it with the international countries. NPO has been conducting energy conservation training in ten major cities of Pakistan to raise energy consumption awareness under Energy Conservation through the Training and Mass Awareness Campaign (TMAC) project of ENERCON;
- **Small and Medium Enterprise Development Authority (SMEDA):** It is a premier institution of the Government under the Ministry of Industries and Production. SMEDA was established in October 1998 to take on the challenge of developing SMEs in Pakistan. SMEDA is not only an SME policy-advisory body for the government of Pakistan but also provides practical business development services to small and medium enterprises. Supported by GIZ, SMEDA has focused on the textile sector to introduce energy efficiency improvement through the Energy Management System approach, in cooperation with ENERCON and APTMA (All Pakistan Textile Mills Association).

In Component 1 the following organizations were to play important role:

- The **Alternative Energy Development Board (AEDB)** was established in 2003 to act as a central agency for the development, promotion, and facilitation of renewable energy technologies, formulation of plans, policies, and development of a technological base for manufacturing of renewable energy equipment in Pakistan.
- The **National Energy Conservation Centre (ENERCON)** was established in 1986 to serve as the Government's focal implementing agency to promote energy conservation in Pakistan;

The project was implemented in close cooperation with the private sector through chambers of commerce and industries (CCIs), such as the **Federation of Pakistan Chambers and Commerce and Industry (FPCCI)** and local chambers of commerce and industry.

The **Pakistan Council of Renewable Energy Technologies (PCRET)** was established by merging the National Institute of Silicon Technology (NIST) and the Pakistan Council for Appropriate Technologies (PCAT) on May 8, 2001. It is the prime institution in the country for coordinating R&D and promotional activities in different renewable energy technologies.

There are several **international and national financial institutions** and banks supporting RE and EE projects in the country. The important international financial institutions include World Bank, and Asian Development Bank (ADB). The national banks include the State Bank of Pakistan (SBP), National Bank of Pakistan (NBP), SME Bank Pakistan, Habib Bank, Bank Al-Falah, Pak-Kuwait Equity Ltd, and Agriculture Development Bank of Pakistan (ADBP), and Punjab Small Industries Cooperation (PSIC). The State Bank of Pakistan has recently established a credit line to support RE/EE projects up to 20 MW for SMEs in the country. UNIDO has been working with local banks including SBP, NBP, and ADBP within various ongoing programs such as the cluster development program and the CFC Phase-out. SBP, NBP, SME Bank, and ADBP

have expressed interest to offer credit lines to SMEs under the scope of the proposed project. Also, the Punjab Small Industries Cooperation (PSIC) may make available a credit line of up to PKR 20 million for each industry in the future.

Under the 18th Amendment to the Constitution of Pakistan, the coordination with **the provincial energy departments/ministries** has been foreseen, particularly with the **Punjab Power Development Board (PPDB)**. PPDB has proposed to introduce two non-grant instruments to support investments for energy projects in the province of Punjab:

- The *Punjab Power Development Fund (PPDF)* would be dedicated to 'equity participation' with the 'private sector' towards the capital cost of the power projects. Initially, the Government of Punjab will inject an amount of PKR 6 billion into the fund and it is anticipated to attract an equal amount from international investors.
- The *Punjab Power Guarantee Fund' (PPGF)* is being created to give assurance by the Government of Punjab to the developers of off-grid power projects for payment defaults, if any, by the power purchasers (such as industrial estates and/or industrial companies). Provision of money into this Fund will be the sole responsibility of the Government of Punjab. Therefore, the UNIDO/GEF project would focus to strengthen such initiatives in collaboration with PPDB as well as supporting establishing such funds, upon request, in other provincial energy departments/ministries.

## 2) Institutional setup

The project was implemented by UNIDO. UNIDO will manage the overall project budget and report to GEF. UNIDO will be responsible for monitoring the project implementation, timely reporting the progress to GEF as well as organizing mandatory and non-mandatory evaluations. It will also support in procurement of the required expert services and other project inputs and administer the required contracts. Furthermore, UNIDO will support the coordination of networking with other related initiatives and institutions in the country and the region. To separate project implementation from project execution, UNIDO has identified NPO as the national executing partner in this project. NPO will be the main executing partner of the project and UNIDO will enter into a contract with NPO to execute the project with clear deliverables and timelines. The exact details will be described in the contractual arrangements with the NPO.

UNIDO contracted a **National Project Coordinator (NPC)**. The Project Manager (responsible for the project at UNIDO HQs.) he/she will be responsible for the overall guidance of the project, including (i) coordinating the project activities with the stakeholders and industry; (ii) certifying that the expenditures are in line with approved budgets and work-plans; (iii) facilitating, monitoring, and reporting on the procurement of inputs and delivery of outputs; and (v) reporting to UNIDO on project delivery and impact. The exact details will be described in the contractual arrangements with the NPC.

A **Project Management Unit (PMU)** will be set up by UNIDO and the project partners (NPO) that will ensure adequate organizational structure and systems for facilitating implementation. The physical location for the PMU will be determined later, but will likely be at UNIDO's premises in Islamabad. To ensure national ownership, NPO will designate a senior official as the **Project Focal Point (PFP)**. Adequate numbers of technical experts in different disciplines and project management experts/consultants with expertise in project, finance, energy, legal matters, etc. will be associated on a longer-term or short-term basis depending upon the workload. The requirement of additional support staff for fieldwork will be assessed and experts will be engaged on a contract/assignment basis as per requirement. NPO will make available staff members as Technical Representatives for the PMU.

A **Project Steering Committee (PSC)** was established at the inception of the project to monitor the project's progress, guide its execution, and support the project in achieving its outputs and outcomes. The PSC is made up of representatives of all agencies which are involved in execution



directly or which have a legal or regulatory stake in project outcomes or execution. The PSC will be chaired by the CEO of NPO (National Productivity Organization) and will meet quarterly. These agencies are likely to include: The small and Medium Enterprise Development Authority (SMEDA); the Ministry of Climate Change; UNIDO, as well as Alternative Energy Development Board (AEDB) and ENERCON. The final list of PSC members will be issued at the outset of project operations and presented in the Inception Report. Other members can be invited by the decision of the PSC on an as-needed basis, however, by taking care that the PSC remains operational by its size. As part of the requirements of implementing this project, UNIDO will provide overall management guidance to the project, compile and present progress reports and ensure the quality of the different activities.

## **5. Budget information**

<b>Project Components</b>	<b>Grant Type*</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Trust Fund</b>	<b>Indicative Grant Amount (USD)</b>	<b>Indicative Co-financing (USD)</b>
1. Develop policy and regulatory framework to support the uptake of EE and RE in industry	TA	Conducive policy and regulatory framework established.	1.1 Existing policy and regulatory framework reviewed and recommendations made (including financial and non-financial incentives and instruments)	GEFTF	229,023	1,000,000
			1.2 Recommendations on improvements in policy and regulatory framework adopted and associated advocacy work			
			1.3 Sectoral analysis on EE and RE opportunities, impact assessment and recommended post-project action plan for RE/EE in industry paying special attention to industries that benefit women			
2. Investments in RE and EE in industry	INV	Investments in RE and EE in pilot demonstration carried out and scaled up	2.1 Projects on EnMS and Systems Optimization (SO) assessed and implemented in industrial companies in textile (and other sectors)	GEFTF	2,592,352	26,800,000
			2.2 EE and RE technology support in 1 textile unit			
			2.3 Projects for deployment of RE technologies assessed and implemented in 2 companies			
			2.4 Portfolio of implementation of EnMS/SO and deployment of RE elaborated (incl. finance sources identified) with particular attention to projects that benefit women.			
3. Create platform for promoting investment and sustainability	TA	Investment platform for scaling up investments operational	3.1 Investment platform to promote RE and EE in industrial companies strengthened (non-grant instruments, banking products; awareness creation)	GEFTF	496,000	2,400,000
			3.2 Certification center and textile training facility for experts on RE and EE-EnMS applications established (under NPO) and training and certification programme established paying particular attention to gender mainstreaming			

<b>Project Components</b>	<b>Grant Type*</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Trust Fund</b>	<b>Indicative Grant Amount (USD)</b>	<b>Indicative Co-financing (USD)</b>
			3.3 Training of experts on EE and RE in industrial applications carried out, with at least 20% being women.			
			3.4 National Energy Performance Award scheme introduced			
4. Monitoring and evaluation	TA	Monitoring of results and knowledge disseminated	4.1 Project monitoring and evaluation, knowledge dissemination to include regular reporting, mid-term and terminal evaluation undertaken	GEFTF	64,000	50,000
			Subtotal		3,381,375	30,250,000
			Project management		168,625	950,000
			<b>Total project costs</b>		<b>3,550,000</b>	<b>31,200,000</b>

## II. Scope and purpose of the evaluation

The purpose of the evaluation is to independently assess the project to help UNIDO improve performance and results of ongoing and future programmes and projects. The terminal evaluation (TE) will cover the whole duration of the project from its starting date in June 2014 to the estimated completion date (30 June 2022).

The evaluation has two specific objectives:

- (ii) Assess the project performance in terms of relevance, coherence, effectiveness, efficiency, sustainability and progress to impact; and
- (iii) Outline key findings, lessons and recommendations for enhancing the design of new and implementation of ongoing projects by UNIDO.

## III. Evaluation approach and methodology

The TE will be conducted in accordance with the UNIDO Evaluation Policy<sup>27</sup>, Evaluation Manual and the UNIDO Guidelines for the Technical Cooperation Project and Project Cycle<sup>28</sup>. The GEF Guidelines for GEF Agencies in Conducting Terminal Evaluations, the GEF Monitoring and Evaluation Policy and the GEF Minimum Fiduciary Standards for GEF Implementing and Executing Agencies also apply.

The evaluation will be carried out as an independent in-depth evaluation using a participatory approach whereby all key parties associated with the project will be informed and consulted throughout the evaluation. The evaluation Team Leader will work closely with the Evaluation Manager on the conduct of the evaluation and methodological issues.

The evaluation's analysis will be anchored on a theory of change approach, while mixed methods (primarily interviews and a survey) will be used to collect data and information from a range of sources and informants. It will pay attention to triangulating the data and information collected to strengthen the assessment with evidence from the ground. This is essential to ensure an evidence-based and credible evaluation, with robust analytical underpinning.

The theory of change will outline causal and transformational pathways from the project outputs to outcomes and longer-term impacts, and drivers as well as barriers to achieve them. The learning from this analysis will be useful to feed into the design of future projects so that the management team can effectively manage them based on results.

### 1. Data collection methods

Following are the main instruments for data collection:

- (a) **Desk and literature review** of documents related to the project, including but not limited to:
  - The original project document, monitoring reports (such as progress and financial reports, mid-term review report, output reports, back-to-office mission report(s), end-of-contract report(s) and relevant correspondence.
  - Relevant government and donor policy documents
  - Notes from the meetings of committees involved in the project.
- (b) **Stakeholder consultations** will be conducted through structured and semi-structured interviews and focus group discussion. Key stakeholders to be interviewed include:
  - UNIDO Management and staff involved in the project; and
  - Representatives of donors, counterparts and stakeholders.
- (c) **Field visits**

### 2. Key Evaluation Questions and Criteria

The key evaluation questions are:

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<sup>27</sup>UNIDO. (2015). Director General's Bulletin: Evaluation Policy (UNIDO/DGB/(M).98/Rev.1)

<sup>28</sup>UNIDO. (2006). Director-General's Administrative Instruction No. 17/Rev.1: Guidelines for the Technical Cooperation Programme and Project Cycle (DGAI.17/Rev.1, 24 August 2006)

- (b) What are the key drivers and barriers to achieving the project’s long-term objectives? To what extent has the project helped put in place the conditions likely to address the drivers, overcome barriers and contribute to the long-term objectives?
- (c) How well has the project performed? Has the project done the right things? Has the project done things right, with good value for money?
- (d) What are the project’s key results (outcome and impact)? To what extent have the expected results been achieved or are likely to be achieved? To what extent will the achieved results be sustained after the completion of the project?
- (e) What lessons can be drawn from successful and unsuccessful practices in designing, implementing and managing the project?

These questions will be further broken down in an evaluation framework, to ensure a robust and systematic approach to the evaluation’s assessment. In assessing the project’s sustainability, the evaluation will also identify key risks (e.g., in terms of financial, socio-political, institutional and environmental risks) and explain how these risks may affect the continuation of results after the project ends. Table 1 below provides the evaluation criteria (detailed questions to assess each evaluation criterion are in Annex 2).

**Table 1. Project evaluation criteria**

#	Evaluation criteria	Mandatory rating
<b>A</b>	<b>Impact</b>	<b>Yes</b>
<b>B</b>	<b>Project design</b>	<b>Yes</b>
<b>1</b>	• Overall design	Yes
<b>2</b>	• Log frame	Yes
<b>C</b>	<b>Project performance</b>	<b>Yes</b>
<b>1</b>	• Relevance	Yes
<b>2</b>	• Effectiveness	Yes
<b>3</b>	• Efficiency	Yes
<b>4</b>	• Sustainability of benefits	Yes
<b>D</b>	<b>Cross-cutting performance criteria</b>	
<b>1</b>	• Gender mainstreaming	Yes
<b>2</b>	• M&E: ✓ M&E design ✓ M&E implementation	Yes
<b>3</b>	• Results-based Management (RBM)	Yes
<b>E</b>	<b>Performance of partners</b>	
<b>1</b>	• UNIDO	Yes
<b>2</b>	• National counterparts	Yes
<b>3</b>	• Donor	Yes
<b>F</b>	<b>Overall assessment</b>	<b>Yes</b>

### **Performance of partners**

The assessment of performance of partners will *include* the quality of implementation and execution of the GEF Agencies and project executing entities (EAs) in discharging their expected roles and responsibilities. The assessment will take into account the following:

- Quality of Implementation, for example: the extent to which the agency delivered effectively, with focus on elements that were controllable from the given GEF Agency’s perspective and how well risks were identified and managed.

- Quality of Execution, for example: appropriate use of funds, procurement and contracting of goods and services.

**Other Assessments required by the GEF for GEF-funded projects:**

The terminal evaluation will assess the following topics, for which ***ratings are not required:***

- Need for follow-up:** for instance, if there are indications of financial mismanagement, unintended negative impacts or risks.
- Co-financing:** this refers to the extent to which the expected co-financing was mobilized, whether co-financing was administered by the project management or by some other organization; whether and how shortfall or excess in co-financing affected project results.
- Environmental and Social Safeguards<sup>29</sup>:** appropriate environmental and social safeguards were addressed in the project's design and implementation, such as, preventive or mitigation measures for any foreseeable adverse effects and/or harm to environment or to any stakeholder.

**3. Rating system**

In line with the practice adopted by many development agencies, the UNIDO Independent Evaluation Division uses a six-point rating system, where 6 is the highest score (highly satisfactory) and 1 is the lowest (highly unsatisfactory) as per table 2.

Table 2. Project rating criteria

Score		Definition	Category
6	Highly satisfactory	Level of achievement clearly exceeds expectations and there is no shortcoming.	SATISFACTORY
5	Satisfactory	Level of achievement meets expectations (indicatively, over 80-95 per cent) and there is no or minor shortcoming.	
4	Moderately satisfactory	Level of achievement more or less meets expectations (indicatively, 60 to 80 per cent) and there are some shortcomings.	
3	Moderately unsatisfactory	Level of achievement is somewhat lower than expected (indicatively, less than 60 per cent) and there are significant shortcomings.	UNSATISFACTORY
2	Unsatisfactory	Level of achievement is substantially lower than expected and there are major shortcomings.	
1	Highly unsatisfactory	Level of achievement is negligible and there are severe shortcomings.	

**IV. Evaluation process**

The evaluation will be conducted from May to August 2022. The evaluation will be implemented in four phases which are not strictly sequential, but in many cases iterative, conducted in parallel and partly overlapping:

- Literature review and Inception phase:** The evaluation team will review project documentation and related literature on the subject and prepare an inception report, which provides details on the evaluation methodology, the evaluation matrix and the

<sup>29</sup>Refer to GEF/C.41/10/Rev.1 available at: [http://www.thegef.org/sites/default/files/council-meetingdocuments/C.41.10.Rev\\_1.Policy\\_on\\_Environmental\\_and\\_Social\\_Safeguards.Final%20of%20Nov%2018.pdf](http://www.thegef.org/sites/default/files/council-meetingdocuments/C.41.10.Rev_1.Policy_on_Environmental_and_Social_Safeguards.Final%20of%20Nov%2018.pdf)

adjusted theory of change (based on the literature review). To the extent possible, specific site visits will be selected at this stage. The Inception Report should consider the findings and recommendations of the mid-term review (if available).

- ii. **Data collection:** country visits, interviews (on site and online), survey data analysis
- iii. **Debriefing:** presentation to stakeholders a) in the field and b) at HQ of preliminary findings, conclusions, lessons, and emerging recommendations
- iv. **Report writing:** the draft evaluation report will be sent to key stakeholders for fact checking, before finalisation of the report.

#### V. Time schedule and deliverables

The evaluation is scheduled to take place from May to August 2022. The evaluation field mission is tentatively planned for end of May 2022. At the end of the field mission, there will be a presentation of the preliminary findings for all stakeholders involved in this project in Pakistan. The tentative timelines are provided in Table 3 below.

After the evaluation field mission, the evaluation team leader will visit UNIDO HQ for debriefing and presentation of the preliminary findings of the terminal evaluation. The draft TE report will be submitted 3-4 weeks after the end of the mission. The draft TE report is to be shared with the UNIDO PM, the UNIDO GEF Coordinator and GEF OFP and other stakeholders for receipt of comments. The ET leader is expected to revise the draft TE report based on the comments received, edit the language and form and submit the final version of the TE report in accordance with UNIDO ODG/EIO/EID standards.

**Table 3. Tentative timelines**

Date	Tasks
Early May 2022	Recruitment of evaluation team
Mid May 2022	Desk review and writing of inception report
End May 2022	Briefing with UNIDO project manager and the project team based in Vienna (review inception report)
Early June 2022	Field visit to Pakistan Debriefing in Pakistan (PowerPoint presentation)
End-June	Debriefing for HQ (PowerPoint presentation)
July 2022	Report writing
End-July 2022	Internal peer review of the report by UNIDO and other stakeholder comments to draft evaluation report
August 2022	Finalizing the evaluation report

#### VI. Evaluation team composition

The evaluation team comprises an international evaluator who is also the Team Leader and one national evaluator acting as the team leader. The evaluation team member should have relevant experience and skills in evaluation conduct together with expertise and experience in innovative clean energy technologies. The consultant will be contracted by UNIDO.

According to UNIDO Evaluation Policy, members of the evaluation team must not have been directly involved in the design and/or implementation of the project under evaluation.

The UNIDO Project Manager and the project team in Pakistan will support the evaluation team. The UNIDO GEF Coordinator and GEF OFP(s) will be briefed on the evaluation and provide support to its conduct. GEF OFP(s) will, where applicable and feasible, also be briefed and debriefed at the start and end of the evaluation mission.

An Evaluation Manager from the Evaluation Division will backstop the evaluation and ensure the quality of the evaluation. The UNIDO Project Manager and national project teams will act as resource persons and provide support to the evaluation team and the evaluation manager.

## **VII. Reporting**

### **Inception report**

This Terms of Reference (ToR) provide some information about the evaluation methodology, but this is not as exhaustive. After reviewing the project documentation and initial interviews with the project manager, the Evaluation Team (ET) will prepare an inception report that will operationalize the ToR relating to the evaluation questions. The report will specify the type of data to be collected, the different data collection methods to be used, and develop a theory of change to guide the thinking (methodology). It will be discussed with and approved by the Evaluation Manager.

The Inception Report will focus on the following elements: preliminary project theory model(s); elaboration of evaluation methodology including quantitative and qualitative approaches through an evaluation framework ("evaluation matrix"); mission plan, including places to be visited, people to be interviewed and possible surveys to be conducted and a debriefing and reporting timetable

The ET will present its preliminary findings to the local stakeholders at the end of the field visit and take into account their feed-back in preparing the evaluation report. A presentation of preliminary findings will take place at UNIDO HQ after the field mission.

### **Evaluation report format and review procedures**

The draft report will be completed in close consultation with the Evaluation Manager and circulated to UNIDO staff and national stakeholders associated with the project for factual validation and comments. These observations will be shared via the Evaluation Manager with the Evaluation Team for consideration when finalizing the report.

The report itself should be brief, to the point and easy to understand. It must explain the purpose of the evaluation, what was evaluated, the methods used and the evidence gathered to support conclusions and recommendations.

The report must highlight any methodological limitations, identify key concerns and present evidence-based findings, consequent conclusions, recommendations and lessons. The report should provide information on when the evaluation took place, the places visited, who was involved, and be presented in a way that makes the information accessible and comprehensible. The report should include an executive summary that encapsulates the essence of the information contained in the report to facilitate the dissemination and distillation of lessons. Findings, conclusions, and recommendations should be presented in a complete, logical, and balanced manner. The evaluation report shall be written in English.

## **VIII. Quality assurance**

All UNIDO evaluations are subject to quality assessments. Quality assurance and control is exercised in different ways throughout the evaluation process.

The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality, attached as Annex 4. The applied evaluation quality assessment criteria are used as a tool to provide structured feedback. The draft and final evaluation report are reviewed by UNIDO project manager, who will submit the final report to the GEF Evaluation Office and circulate it within UNIDO.



## Annex 1 - Project Logical Framework

Project Element	KPIs/Indicators	Baseline	Target level
<b>Project objective: To reduce energy-related greenhouse gas emissions by facilitating the creation of a market environment to promote the use of RE/EE technologies and measures in the selected industrial sectors of Pakistan.</b>			
<b>Component 1 - Develop the policy and regulatory framework on use of EE and RE in industry</b>			
<b>Outcome 1: Policy and regulatory framework on EE/RE use in industry improved</b>			
<b>Output 1.1: Existing policy and regulatory framework reviewed and recommendations made (including financial and non-financial incentives and instruments)</b>	1) Specific regulations that promote solar and biomass power generation by industry and incentives for EE in industry	There are many policy and regulatory measures taken by the Government to promote energy conservation and renewable energy in the country. However, these initiatives have resulted in very little achievements in the industry sector because of the lack of targets to improve industrial energy efficiency, the weakness of the existing policy instruments to raise awareness of market players on the promotion of EE and RE, and inadequate financing incentives and mechanisms.	Regulations established within the framework of current RE and power sector legislation that specifically focus on biomass and solar-based power generation in industry (both grid and on-site) and EE incentives through various measures like feed-in-tariffs, soft loans or guarantee schemes, tax rebates, or exceptions
<b>Output 1.2: Recommendations on improvements in policy and regulatory framework adopted and associated advocacy work</b>	2) Adoption of regulations 3) Number of information events and packages on regulations and policy	To help achieve the objectives set in its policies, the Government has adopted the Energy Efficiency Roadmap (2010 – 2019) and prepared the Short-Term Policy on Renewable Energy (2006). This has generated a great deal of interest but has not resulted in significant power capacity addition to the national grid.	Regulations promoting RE/EE in industry are adopted by the Government Information disseminated (amongst decision-makers in government and private sectors)

Project Element	KPIs/Indicators	Baseline	Target level
<b>Output 1.3 Sectoral analysis on EE (and RE) opportunities, impact assessment and recommended post-project action plan for RE/EE in industry as well as gender mainstreaming</b>	4) Analysis carried on RE and EE potential in various industrial subsectors with particular attention to project that benefit women. 5) End-of-project impact assessment carried out 6) Action plan for post project actions	For policy-making purposes, information gathering on specific energy consumption in types of companies (large, medium, small) in various subsectors and comparison with reference values (benchmarking) is another tool. However, no such benchmarks exist for the energy intensive sectors for local industries.	Based on ADB-supported analysis, at least 5 such subsector studies carried out; a study on impacts of realized savings based on earlier NPO/SMEDA work in textile sector One end-of-project impact study (with recommended actions) Plan for post-project actions (based on end-of-project impact study) formulated and discussed at workshop(s)
<b>Component 2 - Investments in RE and EE in industry</b>			
<b>Outcome 1: Investments in RE and EE in pilot demonstration carried out and scaled up</b>			
<b>Output 2.1: Projects on EnMS and Systems Optimization(SO) assessed and implemented in industrial companies in textile (and other sectors)</b>	7) Number of plants in which audits/assessment are carried out 8) Number of energy management plans implemented (in line with EnMS) 9) Number of plants that implement systems optimization	The situation of limiting both electricity and natural gas supply to industries has led companies to look for other alternatives and setting up their own captive power generation, usually based on natural gas. However, the culture of energy saving to reduce connected load is not present. In addition, technical and financial capacity of industry is weak to take advantage of EE optimization related technology.	An estimated 130 energy assessment and audits will be carried out, initially in textile sector, but then spreading out in other subsectors (Based on the analysis in Output 1.3) Formulation and implementation of energy management plans in 75 plants (based on energy assessments) Implementation of systems optimization in 50 plants (based on energy audits mentioned earlier)

Project Element	KPIs/Indicators	Baseline	Target level
<b>Output 2.2: EE and RE technologies support in 1 textile unit</b>	10) EE and RE technology supported in a textile company	The situation of limiting both electricity and natural gas supply to industries has led companies to look for other alternatives and setting up their own captive power generation, usually based on natural gas. As also the supply of natural gas is rationed, they are now looking for alternatives, including locally available renewable sources of energy. Companies are also considering setting up power generation schemes with the purpose of selling power to the grid. However technical and financial capacity of industry is weak to take advantage of EE and RE technology.	Implementation of a 200-kW solar PV plant and installation of an energy efficient socks producing line (with state-of-the-art technology and energy saving measure s)
<b>Output 2.3 RE technologies assessed and implemented in 2 companies</b>	11) Projects for deployment of RE technologies supported (Solar, biomass). 12) Projects for deployment of RE technologies supported (solar & biomass)	The situation of limiting both electricity and natural gas supply to industries has led companies to look for other alternatives and setting up their own captive power generation, usually based on natural gas. As also the supply of natural gas is rationed, they are now looking for alternatives, including locally available renewable sources of energy. Companies are also considering setting up power generation schemes with the purpose of selling power to the grid. However technical and financial capacity of the industry is weak to	Technical support has been provided to the pilot phase of the biomass power plant (heat and power on site 6MW); and the solar power plant (5MW, grid-connected) Pilot project proponents have (post-project) supported through technical designs and technical services.

Project Element	KPIs/Indicators	Baseline	Target level
		take advantage of EE and RE technology.	
<b>Output 2.4: Portfolio of EnMS/SO and deployment of RE elaborated (incl. finance sources)</b>	13) Portfolio of implementation of EnMS/SO and deployment of RE elaborated (incl.finance sources) and focus on industries	No such portfolio exists right now.	List of EE and RE investment opportunities if needed, finance sources are identified and financial engineering supported
<b>Component 3 - Create platform for promoting investment and sustainability</b>			
<b>Outcome 1: Investment platform for scaling up investments operational; Training centres operational and programmes established; Monitoring of results and knowledge disseminated</b>			
<b>Output 3.1: Investment platform to promote RE and EE in industrial companies strengthened (non-grant instruments, banking products; awareness creation)</b>	14) Strengthened 'energy desks at Pakistani organizations that provide info services	Although some credit lines supporting RE/EE projects exist in Pakistan, companies are reluctant to make use of the available funding for a number of reasons. There is a general absence of a culture to consider savings in operating costs and lifecycle costs when making the decision to purchase machinery or set up new installations. Decisions are still mainly driven by the initial cost investment and will not consider payback times over 5 years or so. On the other hand, the companies are not fully aware of the financial opportunities offered by the banking institutions and there is a mismatch between the needs of companies for energy efficiency projects and the financing products offered by banks	Strengthened 'energy desks and services delivered (audits support, best practices, grant and non-grant instruments, finance sources) on EE/RE for industry (NPO; SMEDA,associations)

Project Element	KPIs/Indicators	Baseline	Target level
<b>Output 3.2: Training &amp; Certification Centre and Textile Training Facility for experts on RE and EE EnMS applications established (under NPO) and training and accreditation programme established</b>	15) Certification center for experts on EE/RE applications established 16) Training center for textile industry supported	The technical knowledge and expertise of energy efficient (EE) and renewable energy (RE) technologies are rather limited. There is no formal platform-specific to Energy management to connect different stakeholders and share information.	Strengthened 'Training and Certification Centre' at NPO. Establishment of a training facility for textile subsector supported
<b>Output 3.3: Training of experts on EE and RE in industrial applications carried out with at least 20% being women.</b>	17) Number of experts trained on RE and EE/EnMS/SO applications in industry with at least 20% being women.	Personnel working in this sector change frequently and lack the necessary qualifications. Further, local manufacturers and equipment suppliers require specific training to support the installation and maintenance of RE/EE technologies in the future.	At least 120 experts trained and certified
<b>Output 3.4 National Energy Performance Award scheme introduced</b>	18) Award scheme for energy performance in large companies and SMEs	No such awards currently exist.	Award scheme for energy performance in large companies and SMEs and 'awards' provided on an annual basis with associated publicity
<b>Component 4 – Monitoring and Evaluation</b>			
<b>Outcome 1: Project monitoring and evaluation, knowledge dissemination to include regular reporting, mid-term and terminal evaluation undertaken</b>			
<b>Output 4.1: Project monitoring and evaluation, knowledge dissemination</b>	19) Evaluations mandatory under GEF and UNIDO rules carried out		One mid-term evaluation and one final (terminal) evaluation Regular reporting on project website; Publication of best practice, experience

Project Element	KPIs/Indicators	Baseline	Target level
	20) Experiences and knowledge created by the project captured and disseminated		

## Annex 2 - JOB DESCRIPTIONS



### JOB DESCRIPTION UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

<b>Title:</b>	<b>International Evaluator, Team Leader</b>
Main Duty Station and Location:	Austria (Home-based)
Mission/s to:	Missions to Pakistan (and/or online)
Start of Contract (EOD):	May 2022 (or as soon as possible)
End of Contract (COB):	August 2022
Contract Type:	WAE
Number of Working Days:	40 days

#### ORGANIZATIONAL CONTEXT

The United Nations Industrial Development Organization (UNIDO) is the specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability. The mission of the United Nations Industrial Development Organization (UNIDO), as described in the *Lima Declaration* adopted at the fifteenth session of the UNIDO General Conference in 2013 as well as the *Abu Dhabi Declaration* adopted at the eighteenth session of UNIDO General Conference in 2019, is to promote and accelerate inclusive and sustainable industrial development (ISID) in Member States. The relevance of ISID as an integrated approach to all three pillars of sustainable development is recognized by the 2030 Agenda for Sustainable Development and the related Sustainable Development Goals (SDGs), which will frame United Nations and country efforts towards sustainable development in the next fifteen years. UNIDO's mandate is fully recognized in SDG-9, which calls to "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation". The relevance of ISID, however, applies in greater or lesser extent to all SDGs. Accordingly, the Organization's programmatic focus is structured in four strategic priorities: Creating shared prosperity; Advancing economic competitiveness; Safeguarding the environment; and Strengthening knowledge and institutions.

Each of these programmatic fields of activity contains a number of individual programmes, which are implemented in a holistic manner to achieve effective outcomes and impacts through UNIDO's four enabling functions: (i) technical cooperation; (ii) analytical and research functions and policy advisory services; (iii) normative functions and standards and quality-related activities; and (iv) convening and partnerships for knowledge transfer, networking and industrial cooperation. Such core functions are carried out in Departments/Offices in its Headquarters, Regional Offices and Hubs and Country Offices.

The Directorate of Environment and Energy (EAE) aims to integrate and scale up the energy and environment activities. It focuses on:

- Supporting governments and industries to provide sustainable and resilient soft and hard infrastructure for industrial development,
- Supporting industries to contribute to the climate-neutral circular economy, and

- Supporting governments and industries in fulfilling national commitments under multinational climate and environmental agreements. The Directorate consists of the Department of Environment and the Department of Energy.

Within the Directorate, the Department of Energy (EAE/ENE) aims to assist Member States in the transition to a sustainable energy future under the overarching mandate of ISID, through the application of renewable energy for productive uses, adoption of the efficient use of energy by industry and the introduction of low- carbon technologies and processes. In transitioning to a sustainable energy future, the challenges of addressing energy poverty and climate change become an integral part of the Department's activities.

Within the Department of Energy, the Climate Technology and Innovation Division (EAE/ENE/CTI) is responsible for supporting the Member States with access to and uptake of low-carbon, climate-friendly, and clean energy technologies, innovations, and entrepreneurship. It focuses on supporting entrepreneurship and facilitating the establishment of conducive innovation systems. In addition, the Division is also responsible for supporting member states with enabling markets for low-carbon technologies and their use by industry and local communities, thereby contributing to climate mitigations and resilience in recipient countries.

The UNIDO Independent Evaluation Division (ODG/EIO/IED) is responsible for the independent evaluation function of UNIDO. Through the conduct of independent evaluation, it supports learning and accountability, while providing evidence of project and programme results as well as good practices. The analyses aim to inform both programme development and strategic decision-making. ODG/EIO/IED is guided by the UNIDO Evaluation Policy, which is aligned to the norms and standards for evaluation in the UN system.

This position will be managed by the Independent Evaluation Division (ODG/EIO/IED) in accordance with the UNIDO Evaluation Policy. For that purpose, and in conformity with the UNIDO Evaluation Manual, an Evaluation Manager has been assigned by ODG/EIO/IED, whose primary function is to ensure the quality of the evaluation process and products and thus, assure the independence of the evaluation.

## **PROJECT CONTEXT**

Sustainable Energy Initiative for Industries in Pakistan is a GEF-funded project, seeking to reduce energy-related greenhouse gas emissions by facilitating the creation of a market environment to promote the use of EE and RE technologies and measures in the selected industrial sectors of Pakistan. The project is promoting energy management systems (EnMS), System Optimization (SO), and selected renewable energy (RE) technologies in the industrial sector of Pakistan. This will be achieved through a combination of technical assistance and investment activities including:

1. Establishment of a conducive policy and regulatory framework for the introduction of EnMS/SO and RE applications in industry
2. Capacity strengthening certification institutions for energy experts specialized on EnMS/SO and installation of RE technologies
3. Promotion and up-scaling of investments in energy efficiency (EE) and RE technologies and measures.

The Evaluation Team (ET) will base their analysis on current official planning documentation on the project as well as data collected during the evaluation exercise itself.



Main Duties	Deliverables	Duration	Location
1. Background: Review project documentation, relevant country background information (national policies and strategies, UN strategies, and general economic data).	<ul style="list-style-type: none"> <li>• Draft evaluation matrix (framework)</li> <li>• Stakeholder list (including country representatives, business and industrial associations, companies, partner institutions, support institutions, etc.)</li> </ul>	4 days	Home-based
2. Methodology: Outline the evaluation questions that will guide the evaluation throughout the data collection and analysis phase of the evaluation. <ul style="list-style-type: none"> <li>• Prepare an updated theory of change based on analysis of documentation and the logical framework.</li> <li>• Develop key survey questions and interview protocols, tailored to the project context.</li> </ul>	<ul style="list-style-type: none"> <li>• Draft theory of change and Evaluation framework for submission to the Evaluation Manager for clearance</li> <li>• Data collection instruments for clearance by the Evaluation Manager</li> <li>• Division of labour within the Evaluation Team</li> </ul>	4 days	Home based
3. Mission Planning: Briefing with the UNIDO Independent Evaluation Division, project managers and selected key stakeholders at UNIDO HQ.	<ul style="list-style-type: none"> <li>• Detailed evaluation schedule with tentative mission agenda (incl. list of stakeholders to interview and site visits); mission planning.</li> </ul>	3 days	Online
4. Data Collection: Conduct the interviews with key informants, administer the survey, and organize focus group meetings to gather data on project performance so far. This might take place in person or online, depending on travel regulations <sup>30</sup> .	<ul style="list-style-type: none"> <li>• Interview protocols and notes</li> <li>• Survey results</li> <li>• Emerging findings</li> </ul>	14 days	Pakistan
5. Feedback: Discuss and share the evaluation's preliminary findings, conclusions, and recommendations to the national stakeholders.	<ul style="list-style-type: none"> <li>• Presentation of the evaluation's preliminary findings, conclusions, and recommendations to stakeholders in the country.</li> </ul>	1 day	Pakistan
6. Feedback: Present findings, lessons, good practices, strengths and weaknesses, and recommendations to key stakeholders at UNIDO HQ for early feedback to finalise the evaluation report.	<ul style="list-style-type: none"> <li>• PowerPoint presentation, incorporating feedback from national stakeholders</li> </ul>	1 day	Vienna, Austria; online

<sup>30</sup> The exact mission dates will be decided in agreement with the Consultant, ITPO Japan and the Evaluation Manager.

Main Duties	Deliverables	Duration	Location
<p>7. Report Writing: Analyze survey results and interview protocols to prepare the evaluation report according to TOR and as agreed with the Team Leader.</p> <p>Prepare the evaluation report in close collaboration with the National Evaluator and in consultation with the Evaluation Manager.</p> <p>Share the evaluation report with UNIDO HQ and national stakeholders for feedback and comments.</p>	<ul style="list-style-type: none"> <li>• Draft evaluation report.</li> </ul>	10 days	Home-based
<p>8. Revise the draft evaluation report based on comments from UNIDO Independent Evaluation Division and stakeholder based on UNIDO standards.</p>	<ul style="list-style-type: none"> <li>• Final evaluation report submitted to the Evaluation Manager</li> </ul>	5 days	Home-based
		37 days	

## REQUIRED COMPETENCIES

### Core Values

**WE LIVE AND ACT WITH INTEGRITY:** work honestly, openly and impartially.

**WE SHOW PROFESSIONALISM:** work hard and competently in a committed and responsible manner.

**WE RESPECT DIVERSITY:** work together effectively, respectfully and inclusively, regardless of our differences in culture and perspective.

### Key Competencies

**WE FOCUS ON PEOPLE:** cooperate to fully reach our potential –and this is true for our colleagues as well as our clients. Emotional intelligence and receptiveness are vital parts of our UNIDO identity.

**WE FOCUS ON RESULTS AND RESPONSIBILITIES:** focus on planning, organizing and managing our work effectively and efficiently. We are responsible and accountable for achieving our results and meeting our performance standards. This accountability does not end with our colleagues and supervisors, but we also owe it to those we serve and who have trusted us to contribute to a better, safer and healthier world.

**WE COMMUNICATE AND EARN TRUST:** communicate effectively with one another and build an environment of trust where we can all excel in our work.

**WE THINK OUTSIDE THE BOX AND INNOVATE:** To stay relevant, we continuously improve, support innovation, share our knowledge and skills, and learn from one another.

## MINIMUM ORGANIZATIONAL REQUIREMENTS

**Education:** Advanced degree in economics, development studies or related areas

**Technical and Functional Experience:**

- Minimum of 15 years' experience in investment and technology promotion and/or evaluation (of development projects)
- Knowledge of national investment policies, infrastructure, and scope
- Experience in the evaluation of skills development projects and knowledge of UNIDO activities an asset
- Knowledge about multilateral technical cooperation and the UN, international development priorities and frameworks
- Working experience in developing countries.

**Languages:** Fluency in written and spoken English is required. All reports and related documents must be in English and presented in electronic format.

**Absence of conflict of interest:** According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from 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 consultants will not seek assignments with the manager/s in charge of the project before the completion of this contract.



**UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION  
TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)**

Title:	National Evaluation Consultant
Main Duty Station and Location:	Pakistan (Home-based)
Mission/s to:	Travel to potential sites in Pakistan
Start of Contract (EOD):	May 2022 (or As soon as possible)
End of Contract (COB):	August 2022
Contract Type:	WAE
Number of Working Days:	50 days

**ORGANIZATIONAL CONTEXT**

The United Nations Industrial Development Organization (UNIDO) is the specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability. The mission of the United Nations Industrial Development Organization (UNIDO), as described in the *Lima Declaration* adopted at the fifteenth session of the UNIDO General Conference in 2013 as well as the *Abu Dhabi Declaration* adopted at the eighteenth session of UNIDO General Conference in 2019, is to promote and accelerate inclusive and sustainable industrial development (ISID) in Member States. The relevance of ISID as an integrated approach to all three pillars of sustainable development is recognized by the 2030 Agenda for Sustainable Development and the related Sustainable Development Goals (SDGs), which will frame United Nations and country efforts towards sustainable development in the next fifteen years. UNIDO's mandate is fully recognized in SDG-9, which calls to "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation". The relevance of ISID, however, applies in greater or lesser extent to all SDGs. Accordingly, the Organization's programmatic focus is structured in four strategic priorities: Creating shared prosperity; Advancing economic competitiveness; Safeguarding the environment; and Strengthening knowledge and institutions.

Each of these programmatic fields of activity contains a number of individual programmes, which are implemented in a holistic manner to achieve effective outcomes and impacts through UNIDO's four enabling functions:

- technical cooperation
- analytical and research functions and policy advisory services
- normative functions and standards and quality-related activities
- Convening and partnerships for knowledge transfer, networking and industrial cooperation.

Such core functions are carried out in Departments/Offices in its Headquarters, Regional Offices and Hubs and Country Offices.

The Directorate of Environment and Energy (EAE) aims to integrate and scale up the energy and environment activities. It focuses on:

- Supporting governments and industries to provide sustainable and resilient soft and hard infrastructure for industrial development,
- Supporting industries to contribute to the climate-neutral circular economy, and
- Supporting governments and industries in fulfilling national commitments under multinational climate and environmental agreements. The Directorate consists of the Department of Environment and the Department of Energy.

Within the Directorate, the Department of Energy (EAE/ENE) aims to assist Member States in the transition to a sustainable energy future under the overarching mandate of ISID, through the application of renewable energy for productive uses, adoption of the efficient use of energy by industry and the introduction of low- carbon technologies and processes. In transitioning to a sustainable energy future, the challenges of addressing energy poverty and climate change become an integral part of the Department's activities.

Within the Department of Energy, the Climate Technology and Innovation Division (EAE/ENE/CTI) is responsible for supporting the Member States with access to and uptake of low-carbon, climate-friendly, and clean energy technologies, innovations, and entrepreneurship. It focuses on supporting entrepreneurship and facilitating the establishment of conducive innovation systems. In addition, the Division is also responsible for supporting member states with enabling markets for low-carbon technologies and their use by industry and local communities, thereby contributing to climate mitigations and resilience in recipient countries.

The UNIDO Independent Evaluation Division (ODG/EIO/IED) is responsible for the independent evaluation function of UNIDO. Through the conduct of independent evaluations, it supports learning and accountability, while providing evidence of project and programme results as well as good ISID practices. Evaluations aim to inform both programme development and strategic decision-making. ODG/EIO/IED is guided by the UNIDO Evaluation Policy, which is aligned to the UN system's evaluation norms and standards.

This position will be managed by the Independent Evaluation Division (ODG/EIO/IED), in accordance with the UNIDO Evaluation Policy. For that purpose, and in conformity with the UNIDO Evaluation Manual, an Evaluation Manager has been assigned by ODG/EIO/IED, whose primary function is to ensure the quality of the evaluation process and products and thus, assure the independence of the evaluation.

## **PROJECT CONTEXT**

Sustainable Energy Initiative for Industries in Pakistan is a GEF-funded project, seeking to reduce energy-related greenhouse gas emissions by facilitating the creation of a market environment to promote the use of EE and RE technologies and measures in the selected industrial sectors of Pakistan. The project is promoting energy management systems (EnMS), System Optimization (SO), and selected renewable energy (RE) technologies in the industrial sector of Pakistan. This will be achieved through a combination of technical assistance and investment activities including:

4. Establishment of a conducive policy and regulatory framework for the introduction of EnMS/SO and RE applications in industry

5. Capacity strengthening certification institutions for energy experts specialized on EnMS/SO and installation of RE technologies
6. Promotion and up-scaling of investments in energy efficiency (EE) and RE technologies and measures.

The Evaluation Team (ET) will base its analysis on current official planning documentation on the project as well as data collected during the evaluation exercise itself.

The Evaluation Team (ET) will base its analysis on current official planning documentation related to the ITPO's work programme and associated KPIs, as relevant, as well as data collected during the evaluation exercise itself.

Main Duties	Deliverables	Duration	Location
Preparation: Review project documentation, relevant country background information (national policies and strategies, UN strategies, and general economic data). Prepare data collection instruments.	<ul style="list-style-type: none"> <li>• Draft evaluation matrix (framework)</li> <li>• Stakeholder list (including country representatives, business and industrial associations, companies, partner institutions, support institutions, etc.).</li> </ul>	6 days	Home-based
2. Methodology: Outline the evaluation questions that will guide the evaluation throughout the data collection and analysis phase of the evaluation. <ul style="list-style-type: none"> <li>• Prepare an updated theory of change based on analysis of documentation and the logical framework.</li> <li>• Develop survey questions and interview protocols, tailored to the project context.</li> </ul>	<ul style="list-style-type: none"> <li>• Draft theory of change and Evaluation framework for submission to the Evaluation Manager for clearance</li> <li>• Data collection instruments for clearance by the Evaluation Manager</li> <li>• Division of labour within the Evaluation Team.</li> </ul>	4 days	Home-based
3. Mission Planning. Briefing with the UNIDO Independent Evaluation Division, project managers and selected key stakeholders at UNIDO HQ.  Project sites to be selected in collaboration with the project management team in Pakistan.	<ul style="list-style-type: none"> <li>• Detailed evaluation schedule with tentative mission agenda (incl. stakeholder list and site visits)</li> </ul>	5 days	Online
4. Data Collection: Conduct the interviews with key informants, administer the survey, and organize focus group meetings to gather data on project performance so far. This might take place in	<ul style="list-style-type: none"> <li>• Interview protocols and notes</li> <li>• Survey results</li> <li>• Emerging findings</li> </ul>	19 days	Pakistan/Online

Main Duties	Deliverables	Duration	Location
person or online, depending on travel regulations <sup>31</sup> .			
5. Feedback: Discuss and share the evaluation's preliminary findings, conclusions, and recommendations to the national stakeholders.	Evaluation presentation of the evaluation's preliminary findings, conclusions, and recommendations to stakeholders in the country.	1 day	Pakistan/O n-line
6. Feedback: Present findings, lessons, good practices, strengths and weaknesses, and recommendations to key stakeholders at UNIDO HQ for early feedback to finalise the evaluation report.	PowerPoint presentation, incorporating feedback from national stakeholders	1 day	Online
7. Report Writing: Analyze survey results and interview protocols to prepare the evaluation report according to TOR and as agreed with the Team Leader.  Prepare the evaluation report in close collaboration with the Evaluation Team Leader and in consultation with the Evaluation Manager.  Share the evaluation report with UNIDO HQ and national stakeholders for feedback and comments	Draft and final evaluation report.	9 days	Home-based
8. Revise the draft evaluation report based on comments from UNIDO Independent Evaluation Division and stakeholders and submit the final version to the Evaluation Manager.	• Final evaluation report submitted to the Evaluation Manager	5 days	Home-based
TOTAL		50 days	

## **REQUIRED COMPETENCIES**

### **Core Values**

**WE LIVE AND ACT WITH INTEGRITY:** work honestly, openly and impartially.

**WE SHOW PROFESSIONALISM:** work hard and competently in a committed and responsible manner.

**WE RESPECT DIVERSITY:** work together effectively, respectfully and inclusively, regardless of our differences in culture and perspective.

<sup>31</sup> The exact mission dates will be decided in agreement with the Consultant, ITPO Japan and the Evaluation Manager.

### **Key Competencies**

**WE FOCUS ON PEOPLE:** cooperate to fully reach our potential –and this is true for our colleagues as well as our clients. Emotional intelligence and receptiveness are vital parts of our UNIDO identity.

**WE FOCUS ON RESULTS AND RESPONSIBILITIES:** focus on planning, organizing and managing our work effectively and efficiently. We are responsible and accountable for achieving our results and meeting our performance standards. This accountability does not end with our colleagues and supervisors, but we also owe it to those we serve and who have trusted us to contribute to a better, safer and healthier world.

**WE COMMUNICATE AND EARN TRUST:** communicate effectively with one another and build an environment of trust where we can all excel in our work.

**WE THINK OUTSIDE THE BOX AND INNOVATE:** To stay relevant, we continuously improve, support innovation, share our knowledge and skills, and learn from one another.

### **MINIMUM ORGANIZATIONAL REQUIREMENTS**

**Education:** Advanced university degree in economics, development studies or other relevant discipline like business administration.

#### **Technical and Functional Experience:**

- Minimum of 10 years' experience in investment and technology promotion and/or evaluation (of development projects)
- Exposure to the needs, conditions and problems in developing countries.
- Exposure to investment and technology promotion
- Familiarity with the institutional context of the project is desirable.
- Experience in the evaluation of development cooperation in developing countries is an asset
- Experience with Japan's donor community and institutions

**Languages:** Fluency in written and spoken English and Japanese 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 coordination of and/or have benefited from 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 consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract.





**UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION  
TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)**

Title:	National consultant for Terminal Evaluation
Main Duty Station and Location:	Home-based, Pakistan
Missions:	Missions to Vienna, Austria, and major cities within Pakistan
Start of Contract (EOD):	25 April 2022
End of Contract (COB):	25 June 2022
Number of Working Days:	50 working days spread over the above-mentioned period

**1. ORGANIZATIONAL CONTEXT**

The United Nations Industrial Development Organization (UNIDO) is the specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization, and environmental sustainability. The mission of the United Nations Industrial Development Organization (UNIDO), as described in the Lima Declaration adopted at the fifteenth session of the UNIDO General Conference in 2013, is to promote and accelerate inclusive and sustainable industrial development (ISID) in the Member States. The relevance of ISID as an integrated approach to all three pillars of sustainable development is recognized by the 2030 Agenda for Sustainable Development and the related Sustainable Development Goals (SDGs), which will frame United Nations and country efforts toward sustainable development in the next fifteen years.

UNIDO's mandate is fully recognized in SDG-9, which calls to "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation". The relevance of ISID, however, applies in a greater or lesser extent to all SDGs. Accordingly, the Organization's programmatic focus is structured in four strategic priorities: Creating shared prosperity; Advancing economic competitiveness; Safeguarding the environment; and Strengthening knowledge and institutions.

Each of these programmatic fields of activity contains several individual programmes, which are implemented holistically to achieve effective outcomes and impacts through UNIDO's four enabling functions: (i) technical cooperation; (ii) analytical and research functions and policy advisory services; (iii) normative functions and standards and quality-related activities; and (iv) convening and partnerships for knowledge transfer, networking, and industrial cooperation. Such core functions are carried out in Departments/Offices in its Headquarters, Regional Offices, and Hubs, and Country Offices.

The Directorate of Environment and Energy (EAE), headed by a Managing Director, aims to integrate and scale up the energy and environment activities focusing on supporting governments and industries to provide sustainable and resilient soft and hard infrastructure for industrial development, supporting industries to contribute to the climate-neutral circular economy, and supporting governments and industries in fulfilling national commitments under multinational climate and environmental agreements. The Directorate consists of the Department of Environment and the Department of Energy.

The responsibility of the Department of Energy (EAE/ENE) is to assist Member States in the transition to a sustainable energy future under the overarching mandate of ISID, through the application of renewable energy for productive uses, adoption of the efficient use of energy by industry and the introduction of low- carbon technologies and processes. In transitioning to a sustainable energy future, the challenges of addressing energy poverty and climate change become an integral part of the Department's activities.

The Climate Technology and Innovation Division (EAE/ENE/CTI) is responsible for supporting the Member States with access to and uptake of low-carbon, climate-friendly, and clean energy technologies, innovations, and entrepreneurship. It focuses on supporting entrepreneurship and facilitating the establishment of conducive innovation systems. In addition, the Division is also responsible for supporting member states with enabling markets for low-carbon technologies and their use by industry and local communities, thereby contributing to climate mitigations and resilience in recipient countries.

## 2. PROJECT CONTEXT

Sustainable Energy Initiative for Industries in Pakistan is a GEF-funded project, seeking to reduce energy-related greenhouse gas emissions by facilitating the creation of a market environment to promote the use of EE and RE technologies and measures in the selected industrial sectors of Pakistan. The project is promoting energy management systems (EnMS), System Optimization (SO), and selected renewable energy (RE) technologies in the industrial sector of Pakistan, This will be achieved through a combination of technical assistance and investment activities including (1) establishment of a conducive policy and regulatory framework for the introduction of EnMS/SO and RE applications in industry, (2) capacity strengthening certification institutions for energy experts specialized on EnMS/SO and installation of RE technologies and (3) promotion and up-scaling of investments in energy efficiency (EE) and RE technologies and measures.

## 3. DUTIES AND RESPONSIBILITIES ARE AS DESCRIBED IN ATTACHMENT 1

MAIN DUTIES	Concrete/ Measurable Outputs to be achieved	Working Days	Location
1. Review project documentation, relevant country background information (national policies and strategies, UN strategies, and general economic data); and relevant GEF documents). Determine key data to collect in the field and adjust the key data collection instrument if needed.	<ul style="list-style-type: none"> <li>Adjust table of evaluation questions, depending on country-specific context;</li> <li>Draft a list of stakeholders to interview during the field missions</li> </ul>	6 days	Home-based
2. Prepare an inception report which streamlines the specific questions to address the key issues in the TOR, specific methods that will be used and data to collect in the field visits, detailed evaluation methodology confirmed, draft theory of change, and tentative agenda for fieldwork.	<ul style="list-style-type: none"> <li>Draft theory of change and Evaluation framework to submit to the Project Manager for clearance</li> </ul>	4 days	Home-based
3. Briefing with the UNIDO project manager and other key stakeholders at UNIDO HQ. Conduct interviews with key selected stakeholders participating in the project through skype, as necessary	<ul style="list-style-type: none"> <li>Detailed evaluation schedule with tentative mission agenda (incl. list of stakeholders to interview and site visits); mission planning;</li> <li>Division of evaluation tasks with the National Consultant.</li> <li>Key feedback from beneficiaries and stakeholders</li> </ul>	2 days	Online

MAIN DUTIES	Concrete/ Measurable Outputs to be achieved	Working Days	Location
4. Conduct stakeholder consultations	<ul style="list-style-type: none"> <li>• Conduct meetings with relevant project stakeholders, beneficiaries, the GEF Operational Focal Point (OFP), etc. for the collection of data and clarifications;</li> <li>• Agreement with HQ and the local field office on the structure and content of the evaluation report and the distribution of writing tasks;</li> <li>• Evaluation presentation of the evaluation's preliminary findings, conclusions, and recommendations to stakeholders in the country, including the GEF OFP, at the end of the mission.</li> </ul>	19 days	Various sites Pakistan
4. Present overall findings and recommendations to the stakeholders at UNIDO HQ	<ul style="list-style-type: none"> <li>• Presentation slides, feedback from stakeholders obtained and discussed</li> </ul>	3 days	Vienna, Austria
5. Prepare the evaluation report according to the TOR (see attachment 1); Coordinate the inputs and combine them into the draft evaluation report. Share the evaluation report with UNIDO HQ and national stakeholders for feedback and comments.	<ul style="list-style-type: none"> <li>• Draft evaluation report.</li> </ul>	13 days	Home-based
6. Revise the draft project evaluation report based on comments from UNIDO Independent Evaluation Division and stakeholders and edit the language and form of the final version according to UNIDO standards.	<ul style="list-style-type: none"> <li>• Final evaluation report.</li> </ul>	3 days	Home-based
	<b>TOTAL</b>	50 days	

#### REQUIRED COMPETENCIES

##### *Core values:*

1. Integrity
2. Professionalism
3. Respect for diversity

##### *Core competencies:*

1. Results orientation and accountability
2. Planning and organizing
3. Communication and trust
4. Team orientation
5. Client orientation

##### *Managerial competencies (as applicable):*

1. Strategy and direction
2. Managing people and performance
3. Judgment and decision making
4. Conflict resolution

6. Organizational development and innovation

#### **MINIMUM ORGANIZATIONAL REQUIREMENTS**

##### **Education:**

Advanced degree in environment, energy, engineering, development studies, or related areas

##### **Technical and functional experience:**

- Minimum of 10years' experience in environmental/energy project management and/or evaluation (of development projects)
- Knowledge about GEF operational programs and strategies and relevant GEF policies such as those on project life cycle, M&E, incremental costs, and fiduciary standards
- Experience in the evaluation of international / GEF projects and knowledge of UNIDO activities as an asset
- Knowledge about multilateral technical cooperation and the UN, international development priorities, and frameworks
- Working experience in Pakistan.

##### **Languages:**

Fluency in written and spoken English is required.

All reports and related documents must be in English and presented in electronic format.

##### **Absence of conflict of interest:**

According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision, and coordination of and/or have benefited from 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 consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract with the project manager located at UNIDO HQ.

**Detailed questions to assess evaluation criteria: See Annex 2 of the UNIDO Evaluation Manual Guiding Evaluation Questions (sample)**

Key evaluation questions	Guiding sub-questions	Means of Measurement	Data Sources
<b>RELEVANCE</b>			
21. How relevant was the project to UNIDO? To target beneficiaries? To the donor?	<ul style="list-style-type: none"> <li>Was the project a technically adequate solution to the development problem?</li> <li>Did the project respond to the cause of the problem?</li> <li>Did the project respond to UNIDO's comparative advantage?</li> </ul>	<ul style="list-style-type: none"> <li>Documented evidence of priority needs for UNIDO, Japan, participating countries and industry stakeholders.</li> <li>Analysis of the project's comparative advantage and feedback from stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Project records on training, # of participants (by gender) and any feedback results</li> <li>Stakeholder &amp; participant Interviews</li> </ul>
22. To what extent was the project suited to the priorities and policies of the target group, recipients, and donor?	<ul style="list-style-type: none"> <li>How did the project fulfil target group needs?</li> <li>To what extent was the project aligned with the development priorities of the countries involved.</li> <li>How did the project reflect donor policies and priorities?</li> <li>Are the original project objectives still valid and pertinent for the target group?</li> </ul>		<ul style="list-style-type: none"> <li>Strategic documents</li> <li>Supervision mission &amp; project reports</li> <li>Government representative interviews</li> <li>UNIDO staff and stakeholder interviews</li> <li>Survey analysis</li> <li>Participant interviews &amp; focus groups</li> </ul>
<b>EFFICIENCY</b>			
23. How economically were resource inputs converted to results?	<ul style="list-style-type: none"> <li>How economically were resources used to produce results?</li> <li>To what extent were expected results achieved within the original budget?</li> <li>What factors impacted the efficiency of achievement of results?</li> <li>Did the project efficiently achieve results compared with alternative approaches?</li> </ul>		
24. Has the project achieved good value for money?			

Key evaluation questions	Guiding sub-questions	Means of Measurement	Data Sources
	<ul style="list-style-type: none"> <li>• What measures were taken during planning and implementation to ensure efficient use of resources?</li> <li>• Was there potential for greater results with the same resource inputs?</li> <li>• Were expected inputs from UNIDO and counterparts provided as planned?</li> </ul>		
25. How timely was the delivery of expected results?	<ul style="list-style-type: none"> <li>• To what extent were expected results achieved within the original timeframe?</li> <li>• What factors impacted the efficiency of achievement of results?</li> <li>• Were project activities in line with scheduling in work plans?</li> </ul>	Timeline review	<ul style="list-style-type: none"> <li>• UNIDO documents</li> <li>• Project documents</li> <li>• Project staff interviews</li> <li>• Stakeholder interviews</li> <li>• KPI Table</li> </ul>
<b>EFFECTIVENESS</b>			
26. Has the project done things right?	<ul style="list-style-type: none"> <li>• What is the quality of results?</li> <li>• How do stakeholders perceive results achieved?</li> <li>• Are results achieved attributable to the project?</li> <li>• Were intended target groups reached by project results?</li> <li>• Is there valid evidence of results achieved?</li> </ul>	<ul style="list-style-type: none"> <li>• Performance by component, activity &amp; indicators</li> <li>• Stakeholder and participant perceptions on performance</li> <li>• Field level assessment of targeting</li> <li>• Stakeholder and participant perceptions on targeting</li> </ul>	<ul style="list-style-type: none"> <li>• Project documents</li> <li>• Progress reports &amp; project database</li> <li>• Relevant government policies</li> <li>• Laboratory documents</li> <li>• Industry documents</li> <li>• Stakeholder interviews</li> <li>• Survey analysis</li> <li>• Participant interviews and FGDs</li> </ul>
27. To what extent have the expected results been achieved or are likely to be achieved? 28. What are the project's key results (outputs, outcome and impact)?	<ul style="list-style-type: none"> <li>• For each project component were targets achieved?</li> <li>• What are the main results of the project at the output and outcome level?</li> </ul>	<ul style="list-style-type: none"> <li>• Performance by component, activity &amp; indicators</li> <li>• Project staff, stakeholders, and participant feedback on results</li> </ul>	<ul style="list-style-type: none"> <li>• Project documents</li> <li>• Progress reports &amp; project database</li> <li>• Laboratory documents</li> <li>• Industry documents</li> <li>• Promotional materials</li> <li>• Survey analysis</li> <li>• Staff and stakeholder interviews</li> </ul>

Key evaluation questions	Guiding sub-questions	Means of Measurement	Data Sources
	<ul style="list-style-type: none"> <li>Were different results achieved in different areas? What are the reasons for any variance?</li> </ul>		
29. What are the key drivers and barriers to achieve the long-term objectives?	<ul style="list-style-type: none"> <li>What factors have affected the achievement of expected results?</li> <li>What factors have assisted towards the achievement of expected results?</li> </ul>	Project staff, stakeholders, and participant feedback on results	<ul style="list-style-type: none"> <li>Project documents</li> <li>Progress reports &amp; project database</li> <li>Industry documents</li> <li>Survey analysis</li> <li>Staff and stakeholder interviews</li> </ul>
<b>COHERENCE</b>			
30. To what extent was the project aligned with the global development agenda?	<ul style="list-style-type: none"> <li>To what extent was the project aligned with the goals and targets of the 2030 Agenda?</li> <li>To what extent was the project aligned with the principles of the 2030 Agenda?</li> <li>Has the extent of alignment with global agendas changed over time?</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Interviews with project staff</li> </ul>	<ul style="list-style-type: none"> <li>Project design documents</li> <li>Staff and stakeholder interviews</li> </ul>
31. To what extent does the project avoid duplication with other similar interventions?	<ul style="list-style-type: none"> <li>To what extent did the project design acknowledge the work of other development actors in the sector?</li> <li>To what extent did project implementation address gaps in other interventions?</li> </ul>	Document review/Interviews with project staff	<ul style="list-style-type: none"> <li>Project design documents</li> <li>Staff and stakeholder interviews</li> </ul>
<b>PROGRESS TO IMPACT</b>			
32. Are there opportunities for broader impact from project results?	<ul style="list-style-type: none"> <li>To what extent are lessons and results from the project incorporated into broader stakeholder mandates and initiatives?</li> <li>Has institutional change resulted from the project?</li> </ul>	<ul style="list-style-type: none"> <li>Strategic review of context</li> <li>Institutional assessment</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Relevant government policies</li> <li>Staff and stakeholder interviews</li> <li>Survey analysis</li> </ul>

Key evaluation questions	Guiding sub-questions	Means of Measurement	Data Sources
	<ul style="list-style-type: none"> <li>To what extent are the project's results replicable?</li> <li>To what extent could the project's approach and results be implemented at a larger scale?</li> </ul>		
33. What long term effects have been produced by the project?	<ul style="list-style-type: none"> <li>What difference has the project made for beneficiaries?</li> <li>To what extent are changes attributable to project activities?</li> <li>What are the social, economic and environmental effects, either short-, medium- or long-term, on a macro and micro level?</li> </ul>	<ul style="list-style-type: none"> <li>Project outcome indicator performance</li> </ul> <p>Strategic analysis of context for contribution to impact</p>	<ul style="list-style-type: none"> <li>Document review</li> <li>Staff and stakeholder interviews</li> <li>Participant interviews and FGDs</li> <li>Survey analysis</li> </ul>
34. What effects from the project were intended and unintended, both positive and negative?	<ul style="list-style-type: none"> <li>What environmental safeguard effects resulted from the project?</li> <li>What economic performance effects resulted from the project?</li> <li>What social inclusiveness effects resulted from the project?</li> <li>Were any results transformational? What was the key change and causes?</li> <li>Were project assumptions valid?</li> </ul>	Contribution analysis from Theory of Change	<ul style="list-style-type: none"> <li>Project documents</li> <li>Staff and stakeholder interviews</li> <li>Participant interviews and FGDs</li> <li>Survey analysis</li> </ul>
35. To what extent has the project helped put in place the conditions likely to address the drivers, overcome barriers and contribute to the long-term objectives?	<ul style="list-style-type: none"> <li>To what extent has the project contributed to reduced policy barriers?</li> <li>To what extent has the project contributed to the application of new knowledge?</li> <li>To what extent has the project contributed to diversified products?</li> <li>To what extent has the project contributed to the increased</li> </ul>	Contribution analysis from Theory of Change	<ul style="list-style-type: none"> <li>Project documents</li> <li>Staff and stakeholder interviews</li> <li>Participant interviews and FGDs</li> <li>Government stakeholder interviews</li> </ul>



Key evaluation questions	Guiding sub-questions	Means of Measurement	Data Sources
	availability of new technology and infrastructure?		
<b>SUSTAINABILITY</b>			
36. To what extent are the achieved results likely to sustain after project completion?	<ul style="list-style-type: none"> <li>• Will project results be sustained after the end of donor funding?</li> <li>• Does the project have an exit strategy? How likely is it that this strategy will succeed?</li> <li>• To what extent have results and outputs been institutionalized?</li> <li>• What is the rate of uptake of new instruments and technologies? Will these rates be sustained/ improved?</li> <li>• Have improved systems been incorporated into state budgets?</li> <li>• Is adequate staffing and support being applied to continue processes?</li> <li>• What progress was made towards the conditions needed to address the long-term objectives?</li> </ul>	<ul style="list-style-type: none"> <li>• Institutional assessment</li> <li>• Stakeholder feedback on sustainability initiatives</li> <li>• Project outcome indicator performance</li> <li>• Institutional assessment</li> <li>• Stakeholder feedback and documentation on budget allocations</li> <li>• Contribution analysis from Theory of Change</li> </ul>	<ul style="list-style-type: none"> <li>• Project documents</li> <li>• Stakeholder and participant interviews/FGDs</li> <li>• Survey analysis</li> <li>• Synthesis of data sources</li> </ul>
37. How resilient to risk are project benefits?	<ul style="list-style-type: none"> <li>• What is the likelihood of financial and economic resources not being available beyond the end of the project?</li> <li>• Are there any social or political risks that may jeopardize the sustainability of project outcomes?</li> <li>• Is the level of stakeholder ownership sufficient to allow for the continuation of project benefits and outcomes?</li> <li>• Are stakeholders aware of the potential of continuing project benefits?</li> </ul>	<ul style="list-style-type: none"> <li>• Risk analysis</li> <li>• Contribution analysis</li> <li>• Stakeholder and participant feedback on ownerships and risks</li> </ul>	<ul style="list-style-type: none"> <li>• Synthesis of data sources</li> <li>• Stakeholder and participant interviews and focus groups.</li> </ul>

Key evaluation questions	Guiding sub-questions	Means of Measurement	Data Sources
	<ul style="list-style-type: none"> <li>Is there sufficient public and stakeholder awareness of project activities and benefits to support the project's long-term project objectives?</li> <li>Have risk management plans been established, including monitoring actions?</li> </ul>		
<b>PERFORMANCE OF PARTNERS</b>			
38. What was the quality of implementation?	<ul style="list-style-type: none"> <li>To what extent did project executing entities deliver effectively?</li> <li>How well did the project executing entities identify and manage risks?</li> </ul>	<ul style="list-style-type: none"> <li>Feedback from project staff and donor representatives</li> <li>Document review</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Interviews with project staff</li> <li>Interviews with donor representatives</li> </ul>
39. What was the quality of execution?	<ul style="list-style-type: none"> <li>Were funds used appropriately?</li> <li>How successful was the procurement and contracting of goods and services?</li> </ul>	<ul style="list-style-type: none"> <li>Feedback from project staff and donor representatives</li> <li>Document review</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Interviews with project staff</li> <li>Interviews with donor representatives</li> </ul>
<b>LESSONS LEARNED</b>			
40. What lessons can be drawn from the successful and unsuccessful practices in designing, implementing and managing the project?	<ul style="list-style-type: none"> <li>Has UNIDO and its partners documented and addressed the lessons in potential follow-on activities?</li> <li>Have lessons learned identified during the mid-term review been actioned?</li> </ul>	<ul style="list-style-type: none"> <li>Performance by component, activity &amp; indicators</li> <li>Staff and stakeholder feedback on implementation lessons</li> <li>Project staff, stakeholder and participant feedback on results</li> </ul>	<ul style="list-style-type: none"> <li>Document review</li> <li>Project staff and stakeholder interviews</li> <li>Survey analysis</li> <li>Synthesis of data sources</li> </ul>

## **Annex 3- Outline of an in-depth project evaluation report**

### **Executive summary (maximum 5 pages)**

Evaluation purpose and methodology

Key findings

Conclusions and recommendations

Project ratings

Tabular overview of key findings – conclusions – recommendations

### **1. Introduction**

1.1. Evaluation objectives and scope

1.2. Overview of the Project Context

1.3. Overview of the Project

1.4. Theory of Change

1.5. Evaluation Methodology

1.6. Limitations of the Evaluation

### **2. Project's contribution to Development Results - Effectiveness and Impact**

2.1. Project's achieved results and overall effectiveness

2.2. Progress towards impact

2.2.1. Behavioral change

2.2.1.1. Economically competitive - Advancing economic competitiveness

2.2.1.2. Environmentally sound – Safeguarding environment

2.2.1.3. Socially inclusive – Creating shared prosperity

2.2.2. Broader adoption

2.2.2.1. Mainstreaming

2.2.2.2. Replication

2.2.2.3. Scaling-up

### **3. Project's quality and performance**

3.1. Design

3.2. Relevance

3.3. Efficiency

3.4. Sustainability

3.5. Gender mainstreaming

### **4. Performance of Partners**

4.1. UNIDO

4.2. National counterparts

4.3. Donor

### **5. Factors facilitating or limiting the achievement of results**

5.1. Monitoring & evaluation

5.2. Results-Based Management

5.3. Other factors

5.4. Overarching assessment and rating table

### **6. Conclusions, recommendations and lessons learned**

6.1. Conclusions

6.2. Recommendations

6.3. Lessons learned

6.4. Good practices

### **Annexes (to be put online separately later)**

- Evaluation Terms of Reference
- Evaluation framework
- List of documentation reviewed
- List of stakeholders consulted
- Project logframe/Theory of Change
- Primary data collection instruments: evaluation survey/questionnaire
- Statistical data from evaluation survey/questionnaire analysis

#### Annex 4: Checklist on evaluation report quality

Project Title:

UNIDO ID:

Evaluation team:

Quality review done by:

Date:

Report quality criteria	UNIDO IEV assessment notes	Rating
a. Was the report well-structured and properly written? (Clear language, correct grammar, clear and logical structure)		
b. Was the evaluation objective clearly stated and the methodology appropriately defined?		
c. Did the report present an assessment of relevant outcomes and achievement of project objectives?		
d. Was the report consistent with the ToR and was the evidence complete and convincing?		
e. Did the report present a sound assessment of sustainability of outcomes or did it explain why this is not (yet) possible? (Including assessment of assumptions, risks and impact drivers)		
f. Did the evidence presented support the lessons and recommendations? Are these directly based on findings?		
g. Did the report include the actual project costs (total, per activity, per source)?		
h. Did the report include an assessment of the quality of both the M&E plan at entry and the system used during the implementation? Was the M&E sufficiently budgeted for during preparation and properly funded during implementation?		
i. Quality of the lessons: were lessons readily applicable in other contexts? Did they suggest prescriptive action?		
j. Quality of the recommendations: did recommendations specify the actions necessary to correct existing conditions or improve operations ('who?' 'what?' 'where?' 'when?'). Can these be immediately implemented with current resources?		
k. Are the main cross-cutting issues, such as gender, human rights and environment, appropriately covered?		
l. Was the report delivered in a timely manner? (Observance of deadlines)		

#### Rating system for quality of evaluation reports

A rating scale of 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 5: Guidance on integrating gender in evaluations of UNIDO projects and Projects**

### **A. Introduction**

Gender equality is internationally recognized as a goal of development and is fundamental to sustainable growth and poverty reduction. The UNIDO Policy on gender equality and the empowerment of women and its addendum, issued respectively in April 2009 and May 2010 (UNIDO/DGB(M).110 and UNIDO/DGB(M).110/Add.1), provides the overall guidelines for establishing a gender mainstreaming strategy and action plans to guide the process of addressing gender issues in the Organization's industrial development interventions.

According to the UNIDO Policy on gender equality and the empowerment of women:

Gender equality refers to the equal rights, responsibilities and opportunities of women and men and girls and boys. Equality does not suggest that women and men become 'the same' but that women's and men's rights, responsibilities and opportunities do not depend on whether they are born male or female. Gender equality implies that the interests, needs and priorities of both women and men are taken into consideration, recognizing the diversity of different groups of women and men. It is therefore not a 'women's issues. On the contrary, it concerns and should fully engage both men and women and is a precondition for, and an indicator of sustainable people-centered development.

Empowerment of women signifies women gaining power and control over their own lives. It involves awareness-raising, building of self-confidence, expansion of choices, increased access to and control over resources and actions to transform the structures and institutions which reinforce and perpetuate gender discriminations and inequality.

Gender parity signifies equal numbers of men and women at all levels of an institution or organization, particularly at senior and decision-making levels.

The UNIDO projects/projects can be divided into two categories: 1) those where promotion of gender equality is one of the key aspects of the project/project; and 2) those where there is limited or no attempted integration of gender. Evaluators should select relevant questions depending on the type of interventions.

### **B. Gender responsive evaluation questions**

The questions below will help evaluators to mainstream gender issues in their evaluations.

#### **B.1. Design**

- Is the project/project in line with the UNIDO and national policies on gender equality and the empowerment of women?
- Were gender issues identified at the design stage?
- Did the project/project design adequately consider the gender dimensions in its interventions? If so, how?
- Were adequate resources (e.g., funds, staff time, methodology, experts) allocated to address gender concerns?
- To what extent were the needs and priorities of women, girls, boys and men reflected in the design?
- Was a gender analysis included in a baseline study or needs assessment (if any)?
- If the project/project is people-centered, were target beneficiaries clearly identified and disaggregated by sex, age, race, ethnicity and socio-economic group?
- If the project/project promotes gender equality and/or women's empowerment, was gender equality reflected in its objective/s? To what extent are output/outcome indicators gender disaggregated?

#### **B.2. Implementation management**

- Did project monitoring and self-evaluation collect and analyze gender disaggregated data?
- Were decisions and recommendations based on the analyses? If so, how?
- Were gender concerns reflected in the criteria to select beneficiaries? If so, how?

- How gender-balanced was the composition of the project management team, the Steering Committee, experts and consultants and the beneficiaries?
- If the project/project promotes gender equality and/or women's empowerment, did the project/project monitor, assess and report on its gender related objective/s?

### **B.3. Results**

- Have women and men benefited equally from the project's interventions? Do the results affect women and men differently? If so, why and how? How are the results likely to affect gender relations (e.g., division of Labour, decision making authority)?
- In the case of a project/project with gender related objective/s, to what extent has the project/project achieved the objective/s? To what extent has the project/project reduced gender disparities and enhanced women's empowerment?