UNIDO INDEPENDENT EVALUATION DIVISION

Independent Thematic Evaluation

Catalyzing market transformation for industrial energy efficiency and accelerate investments in best available practices and technologies in the Former Yugoslav Republic of Macedonia

UNIDO SAP ID: 120127

GEF Project ID: 4902

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Vienna, August 2022

Distr. GENERAL

XXXXXXXX

August 2022

Original: English

This evaluation was managed
by the responsible
UNIDO Project Manager with
quality assurance by the
Independent Evaluation Division

Table of contents

List of tables

List of figures

Acknowledgements

The Evaluation Team engaged to undertake this independent terminal evaluation of the "Catalyzing market transformation for industrial energy efficiency and accelerate investments in best available practices and technologies in the Former Yugoslav Republic of Macedonia" would like to acknowledge and thank all the partners, counterparts, and other actors who shared their valuable perspectives and provided input to this evaluation.

Particular thanks are extended to the Project Manager Mr. Marco Matteini at UNIDO Headquarters in Vienna and the team of the executing partner Resource Environmental Center (REC) North Macedonia (and here in particular to the project manager Ms. Ana Petrovska and the project assistants Ms. Mina Damjanovic-Altandzieva and Ms. Tamara Radovanovik) for their precious time, support, and the organization of the one-week field mission conducted in North Macedonia at the end of June and beginning of July 2022.

The Evaluation Team emphasizes its appreciation to all those interviewed as well as those who contributed their input through an online survey for their openness and the quality of their reflection, which has allowed for the development of robust findings, lessons learned, and recommendations that can usefully guide and inform the design and implementation of projects within the domain of industrial energy efficiency, and beyond.

Evaluation Team:

Mr. Jens Altevogt (Arepo GmbH, Berlin) - International Evaluation Consultant and Team Leader

Ms. Bojana Stanojevska (Center for Climate Change, Skopje) and Mr. Marjan Mihajlov (Maneko Solutions, Skopje) - National Evaluation Consultants

Abbreviations and acronyms

Abbreviation	Meaning
AEA	Austrian Energy Agency
BPID	Best Practices and Information
CASO	Compressed Air System Optimization
CCM	Climate Change Mitigation
COP	(UN Climate Change) Conference of the Parties
EA	Energy Agency
EBRD	European Bank for Reconstruction and Development
EBRD	European Bank for Reconstruction and Development
EE	Energy Efficiency
EnMP	Energy Management Practitioner
EnMS	Energy Management System
ESCO	Energy Service Company
ESO	Energy System Optimization
EU	European Union
EU ETS	Emission Trading Scheme of the European Union
EUR	Euro
GEF	Global Environment Facility
GHG	Greenhouse gas
GJ	Gigajoule
HQ	Headquarters
HS	Highly satisfactory
HU	Highly unsatisfactory
IEE	Industrial Energy Efficiency
ISO	International Organization for Standardization
KPI	Key Performance Indicator
M&E	Monitoring and Evaluation
MANU	Macedonian Academy of Arts and Sciences
MBPD	Macedonian Bank for Promotion and Development
MoE	Ministry of Economy
MoEPP	Ministry of Environment and Physical Planning
MRV	Measurement, Reporting and Verification
MS	Moderately satisfactory
Mtoe	Megatons of oil equivalent
MU	Moderately unsatisfactory
NCPPC	National Cleaner Production Centre
NEEAP	National Energy Action Plan
Oc.	Outcome
Op.	Output
PAC	Project Advisory Committee
PCI	Performance-based Cash Incentive
PIR	Project Implementation Report
PMU	Project Management Unit
RBM	Results Based Management

REC	Resource Environmental Center
RNM	Republic of North Macedonia
S	Satisfactory
SMART	Specific, Measurable, Achievable, Relevant, Time-bound
SSO	Steam System Optimization
TAF	Technical Assistance Facility
tCO_{2equ}	Tons of carbon dioxide (equivalent)
TE	Terminal Evaluation
TJ	Terajoule
TOC	Theory of Change
toe	tons of oil equivalent
ToR	Terms of Reference
U	Unsatisfactory
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organisation
USAID	U.S. Agency for International Development
USD	US dollar

Glossary of evaluation-related terms

Term	Definition
Baseline	The situation, prior to an intervention, against which progress can be assessed.
Effect	Intended or unintended change directly or indirectly due to an intervention.
Effectiveness	The extent to which the development intervention's objectives were achieved or are expected to be achieved.
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.
Impact	Positive &negative, intended & non-intended, directly & indirectly, long term effects that represent fundamental durable change in the condition of institutions, people& their environment brought about by the Project.
Indicator	Quantitative or qualitative factors that provide a means to measure the changes caused by an intervention.
Lessons learned	Generalizations based on evaluation experiences that abstract from the specific circumstances to broader situations.
Logframe (logical framework approach)	Management tool drawing on results-based management principles used to facilitate the planning, implementation and evaluation of an intervention. It involves identifying strategic elements (activities, outputs, outcomes, impacts) and their causal relationships, indicators, and assumptions that may affect project success or failure.
Outcomes	The likely or achieved short- to medium-term behavioural or systemic effects to which the Project contributes, which help to achieve its impacts.
Outputs	The products, capital goods, and services that an intervention must deliver to achieve its outcomes.
Relevance	The extent to which an intervention's objectives are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donor's policies.
Risks	Factors, normally outside the scope of an intervention, which may affect the achievement of an intervention's objectives.
Sustainability	The continuation of benefits from an intervention, after the development assistance has been completed.

Executive Summary

Evaluation purpose and project overview

The purpose of this evaluation is the independent assessment of the project "Catalyzing market transformation for industrial energy efficiency and accelerate investments in best available practices and technologies in the Former Yugoslav Republic of Macedonia" implemented by the United Nations Industrial Development Organization (UNIDO) with funding of the Global Environment Facility (GEF).

The project's overall objective was to reduce greenhouse gas (GHG) emissions of the Macedonian industry by accelerating "market transformation for industrial energy efficiency (IEE) by strengthening policy, regulatory and institutional frameworks and supporting increased diffusion of and investment in best available industrial energy efficiency practices and technologies" in the Republic of North Macedonia. To achieve this objective, the project implemented activities under the following three Components: 1. Strengthening Macedonian policy, regulatory and institutional frameworks for IEE and green industry; 2. Market development support for deployment and diffusion of best available practices and technologies for energy efficiency and environmental sustainability in industry; and 3. Scaling-up of investments in energy efficiency technologies for industry.

The project was a full-sized project funded by the GEF Trust Fund. It had a total volume of USD 6,304,628 of which USD 1,400,000 were financed in the form of a grant by the GEF. The total planned co-financing amounted to USD 5,904,628. The project started on 10 March 2015 and ended on 30 June 2022.

Evaluation methodology

The TE was carried out by an independent team of one international evaluator and two national evaluators in accordance with the required guidance1 following criteria elaborated in the evaluation's Terms of Reference.

The evaluation team adopted a ToC approach to assess the causal links between project activities, outcomes and outputs. A combination of methods was used to deliver evidence-based qualitative and quantitative information from different sources: desk studies and review of literature and data sets collected by UNIDO and the PMU, individual interviews, one focus group meeting with trained national IEE consultants, an online survey carried out among national IEE consultants, and feedback review.

The field mission for the evaluation took place from 29 June to 5 July 2022.

Key findings and conclusions

C1. Progress towards impact

The project has successfully promoted industrial energy efficiency (IEE) in North Macedonia. It has created a legal framework that sets clear incentives for greater energy efficiency in industry, has been highly successful in enabling experts to implement appropriate projects, and has been able to use good practice examples to communicate the benefits of industrial energy efficiency convincingly and credibly to various stakeholders from politics, industry, and in part also the banking sector. The IEE project has thus contributed directly and indirectly to saving energy and greenhouse gas emissions,

[1]UNIDO's 2015 Evaluation Policy, UNIDO's2006 Guidelines for the Technical Cooperation Project and Project Cycle, GEF Guidelines for GEF Agencies in Conducting Terminal Evaluations, GEF Monitoring and Evaluation Policy, and GEF Minimum Fiduciary Standards for GEF Implementing and Executing Agencies.

but also to increasing competitiveness through energy cost savings. The project has succeeded in introducing the concept of Energy Managements Systems (EnMS) in line with ISO 50001 in the country on a sustainable basis: While there was only one ISO 50001 certified company at the start of the project, five additional companies are now certified, and three companies are in the process of preparing for certification. The greatest strength of the project lay in the highly practice-oriented training courses on Energy Management Systems and Energy System Optimization and the support integrated here for industry in implementing appropriate measures. Achievements in the policy component were also satisfactory, as the project succeeded in supporting the implementation of the Law on Energy Efficiency and related regulation for the certification of Energy Management Practitioners. However, the project did not succeed in this component in advancing major progress in national reporting of energy data from industry. In the financial component, the project was able to introduce financial incentives in the form of a Technical Assistance Facility and Performance-based Cash Incentives on a pilot basis. At the impact level, the target of direct greenhouse gas savings of 67 $ktCO_{2equ}$ was exceeded by a factor of five to six, taking into account that one company alone was responsible for approximately 75% of the direct savings totaling 377 $ktCO_{2equ}$. The partner companies reported that they saved at least USD 17.7 million in energy costs (the company with the largest savings accounted for USD 6 million of this). Since the project showcased that considerable amounts of GHG emissions could be saved without any relevant legislation in place and specific preferential loans available, the evaluation concludes that the indirect emission reduction target of 66 $ktCO_{2equ}$ are likely to be achieved as an effect of the new EE legislation introduced in the country.

Overall, the project impact is rated as “highly satisfactory”.

C2. Project Design

The **overall design** of the project was satisfactory, as it was able to make an important contribution in particular with its policy component and the component for substantially building up knowledge and know-how on industrial energy efficiency. The financial component was less important, as the project mainly aimed to raise the potentials of industrial energy efficiency at no-cost or low-cost level. The degree of integration of all project measures and thus the internal consistency is very high. The planned measures and targets were ambitious against the background of the given resources. At the same time, the outcomes were planned very pragmatically by picking up existing national initiatives wherever possible so that they had a good chance of being implemented. The **logframe** design was moderately satisfactory because Outputs and Outcomes were partly not carefully delineated and indicators were only partly SMART. Still, despite these problems, with the description of the project approach in the project document, it was possible to derive a relatively clear picture of the project’s intentions and impact model. The **monitoring and evaluation** (M&E) and the **risk management** plan were rather short and lacked detail.

Overall, the project design is rated as “satisfactory”.

C3. Relevance

At the policy level, the project addresses key existing government strategies and plans in the area of energy efficiency and fills the void that existed until then in terms of IEE. The project also came at the right time for industry. At the time, energy management systems were still very rare in northern Macedonian companies and know-how was hardly widespread, and the potential for untapped no-cost or low-cost measures was correspondingly high. The project was also fully relevant to UNIDO’s

long-term strategy of Inclusive and Sustainable Industrial Development and fully supported GEF-5 strategic objectives on climate change.

The project's relevance is rated as "highly satisfactory".

C4. Effectiveness

At the policy level, the project was successful in assisting the Government in preparing the EE Law and associated regulation for the certification of Energy Management Practitioners. Both components were enacted by the Government and verified and approved by the relevant Government agencies, respectively. Also, a financial incentive was successfully established by including ISO 50001 certification as eligible measure in the "Programme for Competitiveness, Innovations and Entrepreneurship" of the Ministry of Economy (MoE). Furthermore, the IEE Best Practice Dissemination Platform was permanently launched as a sub-domain of the website of the Energy Agency. The planned assessment for the identification and prioritization of suitable climate technologies in the industry is still to be finalized. The development of an industrial energy data management framework could not be realized. The results in the industrial component are particularly strong, where significantly more companies than planned were supported in the introduction of energy management systems and the analysis of ESO measures, and the realization rate of concrete energy-saving measures was significantly higher than expected. In this component, significantly more personnel from industry and national IEE consultants benefited from the training measures. Training participants attested these trainings to be of high to very high quality. The results in the component on financing are below expectations. Although two planned training courses were held and a financial facility for the initiation of investments was set up on a pilot basis, although much later than planned, the establishment of a substantial national loan facility was not possible.

The project's overall effectiveness is rated as "satisfactory".

C5. Efficiency

Efficiency was rated with respect to the extent to which the project has produced results within the expected timeframe and budget as well as its ability to materialize co-financing. The project used its budgeted resources efficiently but suffered from significant delays which can partly be traced back to external events (Government crisis in 2016 and 2017 and COVID 19 pandemic) but are also the result of somewhat delayed intervention by the project to resolve the reasons of the delays. The planned co-financing was realized at slightly more than two-thirds of the planned amount of USD 5.9 million. The reduction is mainly due to the withdrawal of MBPD (USD 3.8 million cash) but could be partly compensated by the significantly higher contribution of the industry (USD 2.6 million instead of USD 0.22 million).

The efficiency of the project is rated as "moderately satisfactory".

C6. Sustainability of Benefits

The exit strategy of the project was successful because the project succeeded in substantially anchoring IEE knowledge in the country and, with the adoption of the EE Law, in creating an important incentive for future industrial energy savings. Another positive aspect of the knowledge transfer is that the national IEE consultants trained by the project have formed an association as a result of the project and the contents of the training courses have been transferred to two new university courses. However, the sustainability of the project is somewhat limited because the many interesting results could have been communicated to other relevant stakeholders more intensely. Financial, socio-

political and environmental risks are very unlikely to jeopardize project results, only the missing resources in the Government Agencies to enforce the EE Law and related regulation could pose a threat to actual implementation of measures but this risk is still considered as moderate.

The rating for sustainability of benefits is “likely”.

C7. Gender Mainstreaming

The project has taken care of gender mainstreaming by monitoring and ensuring the participation of women in decision-making bodies and the participation of a minimum percentage of women in the trainings. Furthermore, the IEE-specific gender case study and the related event helped to further deepen the topic and it was brought to the public in the context of the events in secondary schools. The project was able to take up most of the recommendations of a gender baseline study and case study report produced for the project, even if there still was some room for even greater ambition. In possible future initiatives, the topic should be pursued in any case and with increased ambition due to the inequalities that still exist.

The rating for gender mainstreaming is “highly satisfactory”.

C8. Monitoring and Evaluation (M&E)

The M&E process and specific reporting requirements were sufficient to track targets on the output and outcome level. To track targets in the impact level, the projects has undertaken efforts to collect data from industry. However, numerical analysis of this data proved difficult in this evaluation due to some inconsistencies in the data sets themselves and a missing clear methodology for data analysis. An originally planned mid-term review was not carried out but might have helped to resolve some of the difficulties encountered with the implementation of some outputs.

The rating for M&E implementation is “moderately satisfactory”.

C9. Results-Based Management

The broadly successful implementation of the key outputs and outcomes demonstrates that the project worked results-oriented and had most risks under control. Still, some outputs could not be realized or were significantly delayed. A more differentiated risk analysis and stricter risk management might have helped to resolve the encountered issues. However, the project in most cases showed its ability to adapt to the problems and ensured that almost all outputs were implemented in the end.

The rating for Results-Based Management is “satisfactory”.

C10. Performance of Partners

The very good performance of **UNIDO** and its contributions in particular on the technical level if IEE were highly acknowledged by project beneficiaries and project partners. The UNIDO developed practice-oriented training and support approach proved to be very effective and contributed strongly to observable behavioural change. A stronger supervision and leadership by UNIDO regarding the problems encountered with the implementation of some Outputs might have been advisable, though. The **Ministry of Economy and the Energy Agency** displayed a strong commitment to the project and ensured that important Outputs and Outcomes could be attained. Unfortunately, the engagement of the **Ministry of Environment and Physical Planning** was primarily limited to its role as chair of the PAC; strong engagement with respect to the implementation of the Climate Technology Assessment or the Industrial Data Management Framework was not observed. **REC North Macedonia** fulfilled its role as Project Management Unit successfully. Interviewees acknowledged the high quality of REC’s work and

it was noted by the evaluation team that REC was indispensable for facilitating communication with the industry partners and the acquisition of new partners.

Recommendations

Recommendation 1: Although the project has been able to generate strong impetus in industry for greater energy efficiency, it is clear that so far it has only been possible to lay a first foundation stone. The return to business as usual of some partner companies and the fact that by far not all producing companies in North Macedonia could be reached shows that further efforts are necessary. It is therefore recommended to launch a follow-up initiative as soon as possible, especially in view of the ongoing energy crisis. Such an initiative should also include a stronger consideration of the financing aspect, so that more cost-intensive measures, which are also necessary for the decarbonization of the industry, can be implemented. In this context, it is also recommended to possibly adopt a programmatic approach that broadens the focus and aims at decarbonizing industry not only through energy efficiency measures, but also other measures such as fuel switch or the use of renewable energies in the industrial context.

Recommendation 2: Future projects should ensure that all outcomes receive similar attention. In this project, it was noticeable that the activities around Outcome 2 in particular were pursued with the greatest vigor; accordingly, the greatest progress was also achieved here. Important progress was also made under Outcome 1, although certain compromises had to be accepted here in the achievement of objectives. Outcome 3, although not as important for the success of the project as the other two outcomes, was hardly able to achieve concrete results during the project period. Although this may have been due to the lack of commitment on the part of the MBPD, it is also noticeable that this Component was not pushed with the possible vigor. When designing future initiative, special attention should thus be given to balance out the different components more strongly, for instance by including more external expertise on topics where UNIDO itself might not have its focus.

Recommendation 3: Carry out a more careful and differentiated risk analysis and include higher-level risks especially in the context of institutional/political risks.

Recommendation 4: As is well known, the project in northern Macedonia is only one of many projects in which similar approaches have been applied. UNIDO can justifiably claim that it has set standards in this area and successfully tested promising approaches. In doing so, UNIDO has built up its own expertise and bundles cutting-edge knowledge and know-how from all over the world. In order to move to the next level, it could be useful to establish an international knowledge hub that could help to centralize good practices for different target groups (possibly in different languages), to present knowledge and know-how, to offer networking opportunities, etc.

Recommendation 5: An interesting additional originally unintended result of the project is the introduction of UNIDO training content into the curriculum of higher education. The evaluation team considers this as an important building block for the transformation of a society towards a climate-friendly economy. UNIDO and its partners could consider to make this a standard component in each similar project to further enhance sustainability of results.

Recommendation 6: The project had a particular strength in knowledge transfer, especially for technical staff. In many discussions with the industry but also with the national IEE experts, the special importance was also emphasized at the level of the higher management of companies. The project was aware of this, and accordingly offers were made for training at this level and some dissemination

events. However, the chosen approach was still quite technical. In possible future initiatives, it should be considered that this target group is addressed in a more targeted manner and also through other suitable channels.

Recommendation 7: The collection of data from industry on the benefits of IEE was pursued by the project with some commitment, but the data could not be analyzed easily on a regular basis and the results are subject to some considerable uncertainties. It is recommended to systematically analyze the experiences related to the collection of these data also from other countries and to methodically improve and streamline the monitoring in this field. This would not only increase the accountability of the projects but could also provide interesting impulses for the implementation of national energy monitoring systems and national climate reporting.

Project Ratings

Overall, the project is rated as "Satisfactory". Table 1 provides an overview of the ratings[2].

Table 1: Overview of evaluation ratings

Criterion	Rating
Effectiveness	S
Progress towards Impact	HS
Design	S
Relevance	HS
Efficiency	MS
Sustainability	S
Gender mainstreaming	HS
Performance of partners	S
Monitoring and Evaluation implementation	MS
Results-based Management	S
Overall rating	**S**

[2] According to the evaluation criteria and 6-point scale stipulated in the evaluation's Terms of Reference: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU). Sustainability of Benefits is rated from Highly Likely (HL) to Highly Unlikely (HU)

1 Introduction

1.1 Evaluation Objectives and Scope

The purpose of this evaluation is the independent assessment of the project "Catalyzing market transformation for industrial energy efficiency and accelerate investments in best available practices and technologies in the Former Yugoslav Republic of Macedonia" implemented by the United Nations Industrial Development Organization (UNIDO) with funding of the Global Environment Facility (GEF), referred to as 'the project' from here onwards. This Terminal Evaluation (TE) had the two main objectives of i) assessing the project performance against a set of evaluation criteria and ii) developing a series of findings, lessons, and recommendations for enhancing the design of new and implementation of ongoing projects by UNIDO.

The project was assessed based on the following criteria:

- Achieved results and overall effectiveness;
- Progress towards impact;
- Project quality and performance with the sub-criteria relevance, efficiency, sustainability of benefits, and gender mainstreaming;
- Performance of project partners;
- Factors facilitating or limiting the achievement of results, including monitoring and evaluation (M&E), results-based management, and other factors.

This TE covers the project's entire implementation period from its start on 10 March 2015 until its completion on 30 June 2022.

The key evaluation questions are the following:

a) What are the key drivers and barriers to achieve the 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?
b) How well has the project performed? Has the project done the right things? Has the project done things right, with good value for money?
c) What have been the project's key results (outputs, outcome, and impact)? To what extent have the expected results been achieved or are likely to be achieved? To what extent the achieved results will sustain after the completion of the project?
d) What lessons can be drawn from the successful and unsuccessful practices in designing, implementing, and managing the project?

The Terms of Reference (ToR) of the TE are detailed in Annex i.

1.2 Overview of the Project Context

In 2014, manufacturing had an added value of 11% of the North Macedonian gross domestic product (GDP) or 30% of GDP if construction is included. Industry (incl. construction) is an important employer, engaging about 30% of the work force in 2014 (World Bank 2022). Final energy consumption of the North Macedonian industry grew steadily from 18,237 Terajoule (TJ) in 2002 to 28,261 TJ 2007 and dropped sharply to 18,011 TJ in 2009 due to the global financial and ensuing economic crisis. It then grew again to 26,493 TJ in 2011. After 2011, it declined steadily to 16,251 TJ in 2017 (International Energy Agency 2022). According to the Fourth National Energy Action Plan (NEEAP) this decline was

resulting from the suspension of the production of some factories until they meet newly introduced environmental standards (Government of the RNM 2021).

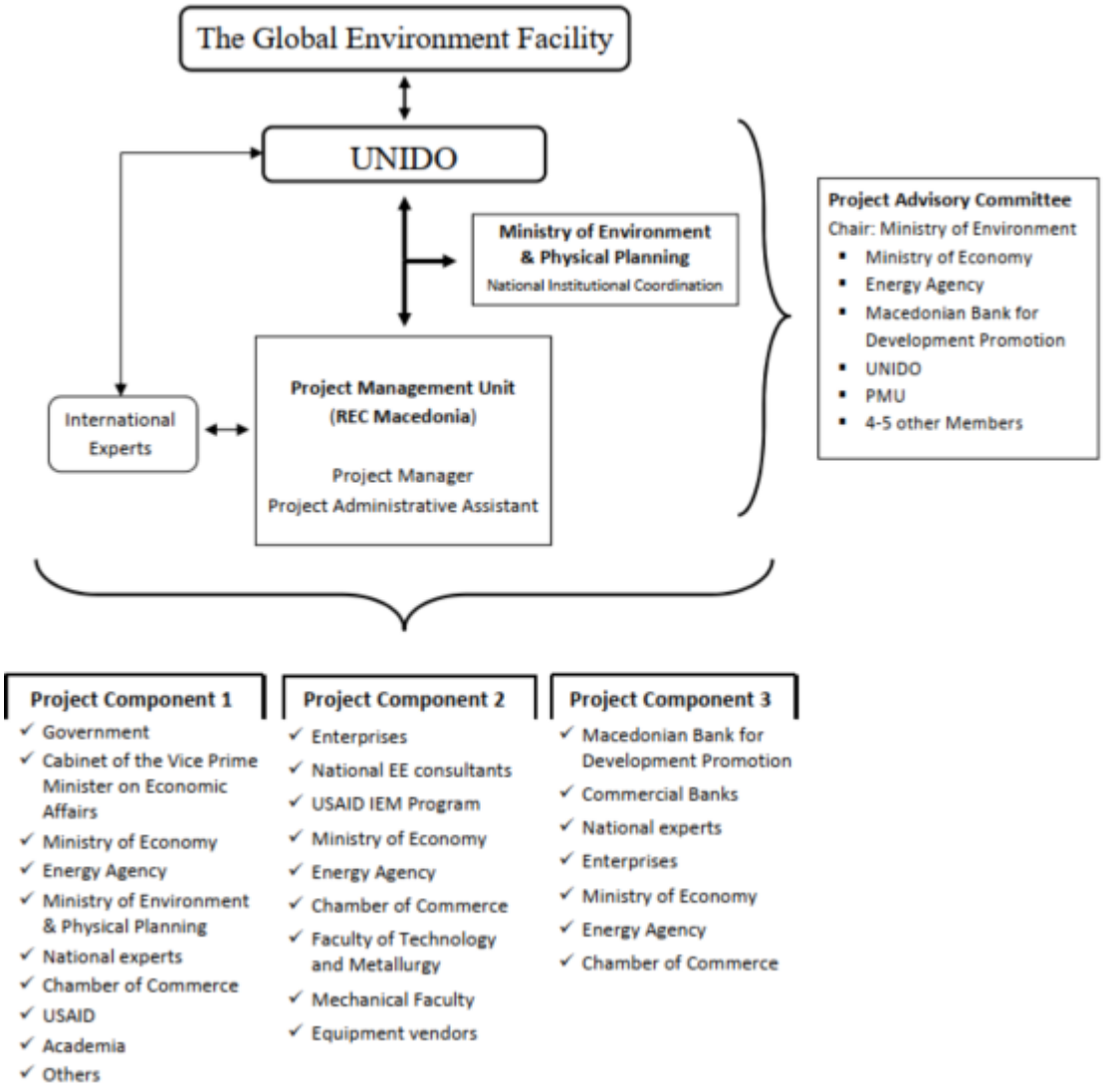
At the time of the project preparation, only insufficient and partly contradictory data and statistics on the energy performance of the North Macedonian manufacturing industry were available. However, based on information from energy audits and surveys conducted by the UNIDO National Cleaner Production Centre (NCPPC) in Skopje during the project preparation phase, it was estimated that the potential energy savings that could be leveraged without major technological changes was in the order of 10% to 20%. According to the Strategy for Improvement of Energy efficiency in the Republic of Macedonia, the industry sector was estimated to have the largest potential for energy savings of all sectors, amounting to cumulated savings of 3,814 TJ in the period from 2010 to 2020 (Astghine Pasoyan et al. 2010).

1.3 Overview of the Project

The project's overall objective was to reduce greenhouse gas (GHG) emissions of the Macedonian industry by accelerating "market transformation for industrial energy efficiency (IEE) by strengthening policy, regulatory and institutional frameworks and supporting increased diffusion of and investment in best available industrial energy efficiency practices and technologies" in the Republic of North Macedonia.

Figure 1 shows the project implementation structure. This structure was generally followed through by the project.

Figure 1: Schematic of the project implementation structure



Source: CEO Endorsement Document

A project management unit (PMU) was established within the Regional Environmental Centre for Central and Eastern Europe – Country Office Macedonia (REC Macedonia), main project executing partner. The PMU has been responsible for the day-to-day management, monitoring and evaluation of project activities on the ground. The PMU has been responsible for the overall coordination of project activities carried out by international and national experts, and by project partners and counterparts. The PMU and REC Macedonia have been also in charge of the direct organization of various seminars and trainings, and execution of other activities.

A Project Advisory Committee (PAC) was established for periodically reviewing project implementation progress, facilitate co-ordination between project partners, provide transparency and guidance, and ensuring ownership, support, and sustainability of the project results. The PAC consisted of representatives of key partner ministries, public institutions, private sector, NGOs, and other international organizations partnering in the project or having relevant ongoing programs.

The Ministry of Environment and Physical Planning (MoEPP) with the GEF Political and Operational Focal Points is the Ministry responsible for the overall national project intendance and the coordination of Government institutions' work. The Ministry of Economy (MoE) and the Energy Agency

(EA) of the Republic of North Macedonia have been leading and/or overseeing most of the substantive work performed under Project Component 1.

The project was a full-sized project funded by the GEF Trust Fund. It had a total volume of USD 6,304,628 of which USD 1,400,000 were financed in the form of a grant by the GEF. The total planned co-financing thus amounted to USD 5,904,628.

The project started on 10 March 2015 and ended on 30 June 2022. The UNIDO Project manager at UNIDO headquarters in Vienna oversaw project implementation and monitoring.

1.4 Reconstructed Theory of Change

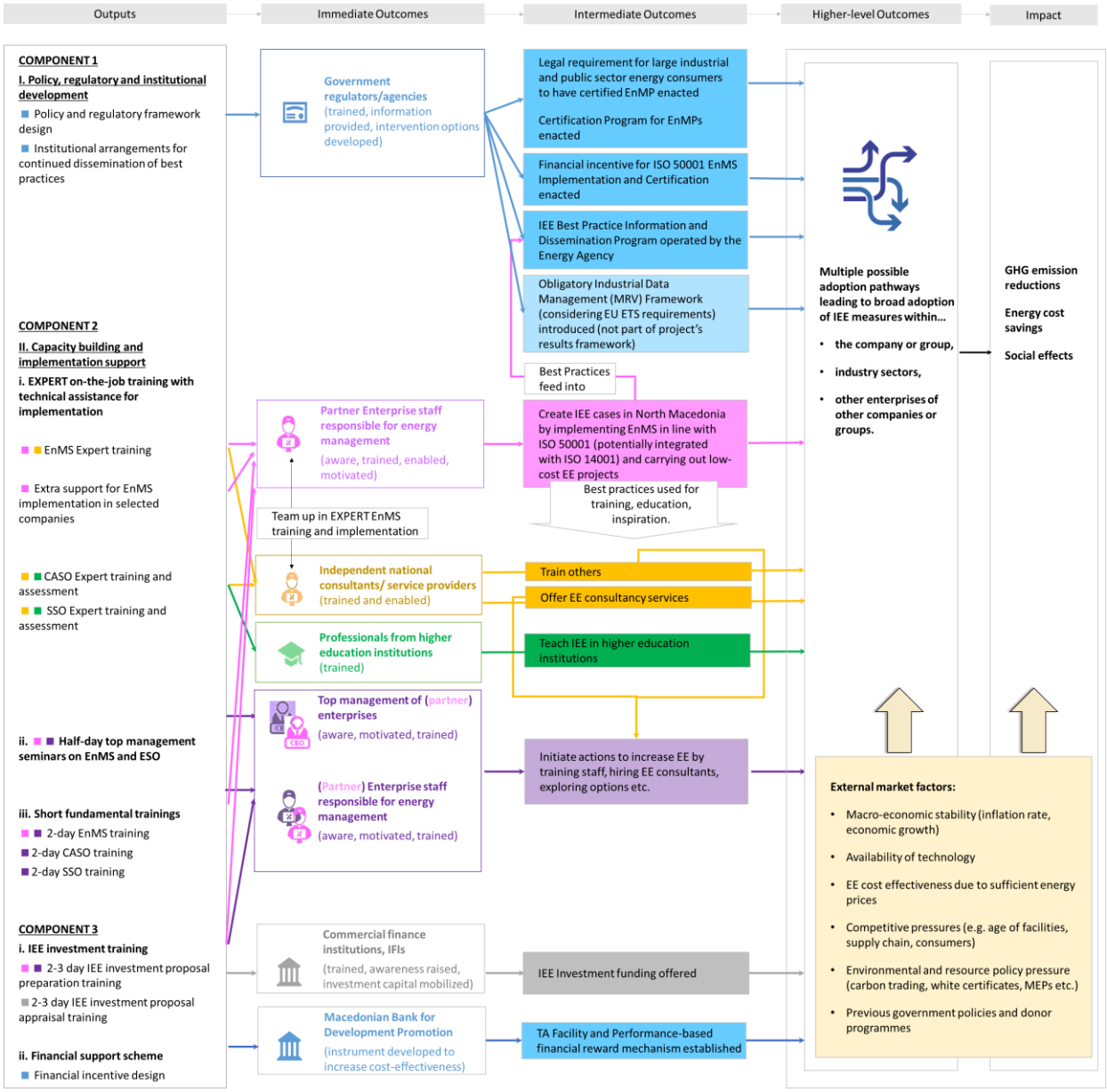
The Request for CEO Endorsement document (hereafter referred to as "project document") does not contain a Theory of Change (ToC), as its submission was not mandatory at the time of project preparation. The evaluation team therefore reconstructed a ToC based on the project logframe, which illustrates the logic chain from the planned outputs to the intended outcomes and finally to the impacts (Figure 2).

The project consisted of the following three components:

- Component 1 "Strengthening Macedonian policy, regulatory and institutional frameworks for IEE and green industry" aimed at accelerating the development and establishment of policies, legislation and programs promoting IEE. Important in the implementation of this project component was also the building of capacities in the political institutions.
- Component 2 "Market development support for deployment and diffusion of best available practices and technologies for energy efficiency and environmental sustainability in industry" focused on capacity building in the industry. It focused on capacity building in the industry and among IEE service providers (IEE consultants) and the adoption of energy management systems (EnMS) and compressed air and steam system optimization (CASO and SSO). To achieve this, in-depth training programmes combined with coaching on real-life problems and implementation of pilot IEE solutions were offered for technical staff. Shorter trainings for managers and other personnel which are key to decision-making in energy-related matters complemented these trainings.
- Component 3 "Scaling-up of investments in energy efficiency technologies for industry" targeted the financial side of IEE investments. It aimed at creating financial incentives to assist the preparation of investment proposals and building financial knowledge and know-how among bank lending officers and IEE consultants.

The Results Framework of this project can be found in Annex v.

Figure 2: Reconstructed Theory of Change of the project



1.5 Evaluation Methodology

The TE was carried out by an independent team in accordance with the required guidance[3] following criteria elaborated in the evaluation's ToR, which were rated using UNIDO's 6-point scale, with justifications elaborated through the report's main body and findings.

The evaluation was carried out using a participatory approach that sought to inform and consult key stakeholders and beneficiaries of the project.

The evaluation team adopted a ToC approach to assess the causal links between project activities, outcomes and outputs. A combination of methods was used to deliver evidence-based qualitative and

[3]UNIDO's 2015 Evaluation Policy, UNIDO's2006 Guidelines for the Technical Cooperation Project and Project Cycle, GEF Guidelines for GEF Agencies in Conducting Terminal Evaluations, GEF Monitoring and Evaluation Policy, and GEF Minimum Fiduciary Standards for GEF Implementing and Executing Agencies.

quantitative information from different sources: desk studies and review of literature and data sets collected by UNIDO and the PMU, individual interviews, one focus group meeting with trained national IEE consultants, an online survey carried out among national IEE consultants, and feedback review. The full list of documents that has been consulted can be found in Annex iii. and the list of stakeholders consulted is added in Annex iv. The survey questionnaire and survey results can be found in Annexes vi. and vii.

The field mission for the evaluation took place from 29 June to 5 July 2022. The evaluation team was composed of an international evaluation consultant (Mr. Jens Altevogt; Arepo GmbH, Berlin) and two national evaluation consultants (Ms. Bojana Stanojevska; Center for Climate Change, Skopje and Mr. Marjan Mihajlov (Maneko Solutions, Skopje)).

1.6 Limitations of the Evaluation

The evaluation team could only visit a limited number of companies, four in total of the more than twenty companies involved. Thus, a detailed verification of the measures implemented was not possible.

The availability of project documents was generally satisfying, still some gaps remained so that some of the results could not be verified in all detail.

Although a wealth of data regarding energy and energy cost savings as well as investments of the companies was collected, some inconsistencies and different ways of responding to the same questions led to some uncertainties when the benefits were calculated. Despite these shortcomings, data was detailed enough to check the plausibility of the data reported by the companies.

2 Project's contribution to Development Results – Effectiveness and Impact

2.1 Project's achieved results and overall effectiveness

Effectiveness refers to the extent to which the development intervention's objectives were achieved, or are expected to be achieved, considering their relative importance (UNIDO 2018). This section discusses the project's objectives in terms of outputs and outcomes – the degree to which the respective targets as defined in the intervention's results framework were achieved. The progress towards impact, will be discussed in section 2.2.

Outcome 1: Enhanced promotion and support of sustainable industrial energy efficiency by strengthened policy and regulatory frameworks and market-based mechanisms

The aim of **Output 1.1** was to develop a legal requirement for large industrial and public sector consumers to have an employee who is a certified energy management practitioner (EnMP) to ensure that the obligated organizations improve their energy management.

In order to achieve this goal, the project has been involved in the working group (which was established in February 2017 by the MoE) for the elaboration of the Energy Efficiency Law (EE Law) for North Macedonia. The drafting of the EE Law was guided by the EU Energy Efficiency Directive. In this Directive, articles 7, 8 and 16 regulate the promotion of energy audits and energy management systems and the availability of qualification, accreditation, and certification schemes, respectively. The project carried out an analytical study on the transposition these articles into the national EE Law. The study was delivered to the Ministry of Economy and the European Bank for Reconstruction and

Development (EBRD), and was taken into account in the further drafting of the EE Law. The EE Law entered into force on 18 February 2020, obliges large enterprises to carry out energy audits every four years and stipulates that the energy audit is either carried out by “independent authorized energy auditors” or “authorized energy auditors of large enterprises employed by the large enterprises”. Furthermore, the EE Law stipulates that an energy audit does not have to be carried out if the enterprise has implemented an energy or environmental management system in compliance with the respective European or International Standards (i.e., ISO).

The EE Law also stipulates that obligatory energy audits must be performed in accordance with the stipulations of the Rulebook on Energy Audits of Large Enterprises. Upon request of the MoE, the project has drafted the Rulebook in cooperation with UNOPS and procured for that purpose the services of the Austrian Energy Agency (AEA). UNIDO has played the part of technical lead, also leveraging the experience of the AEA to develop a technically sound and practically implementable piece of secondary legislation. The Rulebook including all its Annexes has been finally drafted and all stakeholders have provided comments, and the final text was accepted by the Ministry of Economy in June 2022. According to the MoE, the Rulebook is expected to enter into force in autumn 2022, after a public consultation process and clearance by the Government’s Secretariat for Legislation.

The final regulation may deviate slightly from the project's intention of obliging companies to have a person on staff who regularly takes care of energy management. De facto, the EE Law as passed, in conjunction with the Rulebook on Energy Audits for large enterprises, sets clear and binding incentives (mandatory energy audit every four years or alternatively the introduction of a certified energy management system) that the objective of Output 1.1, namely the obligation of large enterprises to deal more intensively with energy management issues and can be considered as clearly achieved. In this context, it should be noted that North Macedonia follows the approach of most EU countries with this approach.

Output 1.2 aimed to ensure that a "Certification Program for Energy Management Practitioners (EnMP)” is developed and put into effect". This Output thus echoed and fleshed out the Rulebook's guidance on "Content and Form of Certificate for Completed Training/Improvement Training of Large Enterprise Energy Auditors" (Section XV of the Rulebook). The project developed the National Occupational Standard for Energy Management System Practitioners, which was successfully verified by the Center for Adult Education and approved by the Ministry of Education and Science in 2021. The training programme is based on the UNIDO EnMS Expert training programme and encompasses 42 classes of theoretical and 45 classes of practical instruction as well as a final exam. REC has been licensed to carry out the Certification Program for EnMP. The objective of output 1.2 was thus fully met.

The objective of **Output 1.3** was the development and enactment of a financial incentive for ISO 50001 certification. The idea of this output was that an already existing Government incentive programme for ISO 9001 and ISO 14001 certification could be extended to ISO 50001 certification. The MoE added ISO 50001 to the eligible measures in its “Programme for Competitiveness, Innovations and Entrepreneurship” already in the year 2016. In that Programme enterprises could apply for a grant of up to EUR 3,000. In the first call (which closed on 31 May 2016). The MoE has continued the Programme until 2022, and ISO 50001 certification permanently remained one of the eligible measures. According to the PIR of June 2021, two companies have made use of this incentive for ISO 50001 certification.

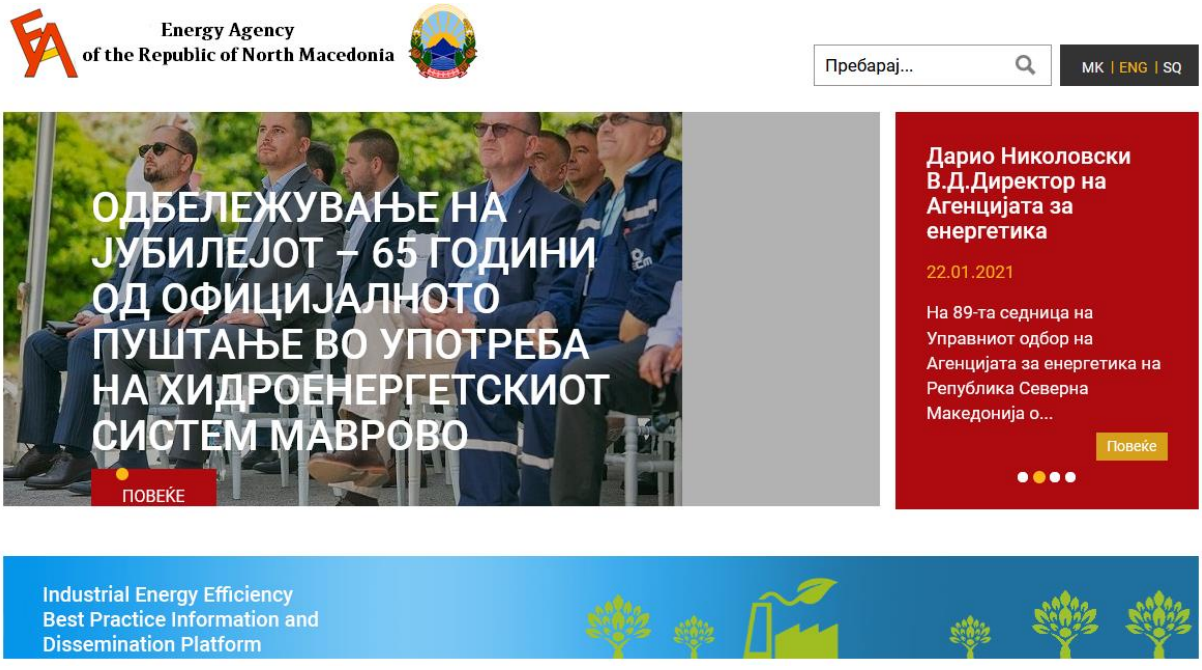
Output 1.4 aimed at addressing awareness and knowledge gaps about IEE opportunities by setting up an IEE Best Practices and Information (BPID) website and organizing an annual one-day workshop to present and exchange IEE best practices primarily to engineers and managers from the industry. The BPID website was launched in June 2021 on a subdomain of the Energy Agency website. A prominently placed banner (see Figure 3) on the EA website leads users to the IEE BPID platform. The evaluation

team has carried out a website review and concludes that the website is well-structured, and the website's sub-pages are filled with relevant information for industry and other interested stakeholders. It includes detailed information about Energy Management Systems (e.g., training material, a step-by-step description of the ISO 50001 certification process, EnMS case studies, the list of UNIDO-qualified national IEE experts, etc.), Energy System Optimization (e.g., a description of ESO principles, CASO and SSO case studies, manuals, etc.), a "News and events" section (through which active calls can also be accessed) as well as background information about the project. However, there are a few possibilities to further improve the website, such as a search engine optimization[4], the addition of videos which have been produced by the project and cross-checking a few links[5].

The second component of this output, the annual one-day workshops, was only partially achieved. The first and only workshop was carried out on 21 November 2019 where more than 100 different participants from project stakeholder groups participated. As good practice results were already available as early as 2016 or 2017 as a result of the pilot Expert trainings and support programmes, it would have been desirable to use the opportunity to disseminate and communicate results earlier which would have been an opportunity to inform and potentially mobilize other industry players early. A second promotional event was planned to be implemented in autumn 2021, but the COVID-19 pandemic forced the project to not further pursue this plan.

Overall, the achievement of output 1.4 is rated as moderately satisfactory.

Figure 3: Homepage of the Energy Agency displaying the IEE BPID website



The objective of **Output 1.5** was the development of an Industrial Data Management Framework. According to the project document, the Industrial Energy Data Management Framework should "a) provide relevant public institutions (Ministry of Economy, Energy Agency and Ministry of Environment [and Physical Planning] with a tool that can ensure greater coherence, increased effectiveness and

[4] The team of national evaluators found out that a google search with relevant search terms in Macedonian language ranks the website quite low.

[5] The links to the social platforms facebook, twitter and youtube are inactive, as well as the link behind the banner "Where and how to apply for measuring equipment".

reduced administration costs of interlinked policy instruments such as EnMS-ISO50001, MRV and EU ETS, b) […] enable MRV and EU ETS benchmarking efforts to effectively build on and benefit from EnMS-ISO50001 implementation and associated strong data management discipline, [and] c) […] assist and guide enterprises in fulfilling data collection and reporting requirements under different regulations, policies and programmes in the most time and cost-effective way." Implementation of this Output was scheduled in the period from the first quarter of 2016 to the first quarter of 2017, but progress was delayed until at least mid-2017. The 8th project progress report points at the political crisis and early elections of 2016 which forced Government Agencies to put on halt many of its ongoing activities, also in the following year 2017. However, even after that and once the work on the EE LAW provided an occasion (i.e., the planned obligation for large enterprises for energy audits) to continue the work on a monitoring system for energy savings, ongoing discussions with the MoEPP never led to any tangible progress on this matter and no progress has been achieved on this Output.

Output 1.6 had the objective to identify, evaluate and prioritize climate technological (energy efficiency) options in the Macedonian industry. This assessment should support the Government to formulate well-targeted strategies, policies, programs, and projects based on the best available technology options. The assessment should also inform and support the work and discussion of the MoEPP and the Government on North Macedonia's National Determined Contributions (Paris Agreement) as well as obligations under the Energy Community Treaty.

In November and December 2019, the project collaborated with the project "Fourth National Plan and Third Two-Year Climate Change Report" implemented by the MoEPP with technical and financial support of the United Nations Development Programme (UNDP) and funded by GEF. In this project, the Macedonian Academy of Arts and Sciences (MANU) prepared the study "Industry Study - Analysis of Measures and Policies (STUIND)" (Natasa Markovska et al. 2019), which describes the role of industry in North Macedonian energy consumption and GH emissions, proposes political measures to mitigate climate change in the industry sector and estimates GHG emission reduction potential of these measures. The UNIDO-REC project contributed a substantial amount of the data generated within its EnMS and ESO training and support programmes under Component 2. The data were used by MANU to model and analyze the impact of various policies, measures, and energy efficiency technologies, including EnMS in line with ISO 50001. One of the key results of this study is an estimate of the energy and GHG reduction potential of technical IEE and soft measures and the introduction of a tax on carbon dioxide emissions on a trajectory from 2020 to 2040.

The MANU-UNDP study served as a starting point for an in-depth assessment of the climate technologies potential in industry and to arrive at a prioritization of appropriate climate technologies. For this purpose, the project has contracted the Macedonian Center for Energy Efficiency (MACEF) to prepare and deliver the assessment and has set a start date for delivering the contract services for December 2021. The research aim is to engage with industrial enterprises to better understand the existing industry climate technologies baseline (knowledge, plans, resources) as well as to prioritize the industry technological priorities for de-carbonization/climate-neutrality based on energy and GHG emission reduction potential. The work on the assessment is strongly delayed. At the time of writing of this evaluation, none of the envisaged deliverables was available yet, except for a working version of an industry questionnaire. Having in mind that the implementation time of the study has been planned with six months and that the questionnaire was under preparation in summer 2022, it is estimated that the assessment report will be available not earlier than November or December 2022.

The objective of **Output 1.7** was to "strengthen the technical capacity of Macedonian institutions responsible for developing, implementing and monitoring energy efficiency and climate change mitigation policies and programs." It was planned to build capacity of at least 25 public officials through two policy-oriented one day trainings. According to the project reports, the project implemented a "stakeholder training on legal requirements for integration of EnMS in EE Law has been organized in

April 2017", attended by ten public officials. Instead of offering a second training the project chose another approach and invited public officials of North Macedonian public institutions to participate in EnMS User and even Expert trainings. Seven public officials participated in the EnMS User training in April 2019 and three public officials in several EnMS Expert trainings. The target of 25 trained public officials was thus met at a level of 80%.

Overall, the achievement of the Outputs under Component 1 is rated as satisfactory.

Achievement of **Outcome 1** is rated as satisfactory because the EE Law and related secondary regulation (Certification Program for EnMP) is enacted and highly likely to enacted soon (Rulebook on the Energy Audit of Large Enterprises), the financial incentive for ISO 50001 proposed by the project was offered every year by the MoE since 2016, and the IEE BPID Platform (website) is now operated with own funds by the EA of the RNM. The slight reduction in the rating was made because there was no progress in the development of the Industrial Energy Data Management Framework in collaboration with the Government.

Table 2: Programmed outputs and Outcomes, indicators and target and achievement rating of Component 1

Programmed Outcomes and Outputs	Indicators and targets	Status of target achievement	Rating
Outcome 1: Enhanced promotion and support of sustainable industrial energy efficiency by strengthened policy and regulatory frameworks and market-based mechanisms	• Extent to which policies, regulations, and programs [*developed under Outputs 1.1, 1.2, 1.3*] *are adopted*	• Energy Efficiency Law adopted; Rulebook on Energy Audits of Large Enterprises expected to enter into force in autumn 2022; National Occupational Standard for Energy Management Practitioners verified by the Center for Adult Education and approved by the Ministry of Education and Science; ISO 50001 certification added as eligible measure in the "Programme for Competitiveness, Innovations and Entrepreneurship" of the MoE, eligibility annually renewed.	HS
	• Operation of IEE BPID website after the end of the project ensured by the Macedonian Energy Agency (yes/no) [*indicator added based on the description of the project approach in the CEO Endorsement document*]	• The website is hosted and operated by the EA.	HS
Output 1.1: Legal requirements for large industrial and public sector energy consumers to have a certified Energy Management Practitioner (EnMP) is developed [*description adapted*]	Macedonian bylaws for EnMP/IEE	Substantial contribution and support to the formulation Energy Efficiency Law and the Rulebook on Energy Audits of Large Enterprises provided	HS
Output 1.2: Certification Program for Energy Management Practitioner (EnMP) is developed [*description adapted*]	Certification Program developed and proposed to Government [*indicator adapted*]	National Occupational Standard for Energy Management Practitioners developed	HS

Programmed Outcomes and Outputs	Indicators and targets	Status of target achievement	Rating
Output 1.3: Financial incentive for ISO 50001 Certification are developed [*description adapted*]	Incentive developed [*indicator adapted*]	Proposal developed to add incentive to "Programme for Competitiveness, Innovations and Entrepreneurship"	HS
Output 1.4: Industrial Energy Efficiency (IEE) Best Practice Information and Dissemination (BPID) Program established and operational	• IEE-BPID website (with elements as described in the project description) established (score of 0 to 4) • Three annual IEE-BPID workshops organized (score of 0 to 4) [*target derived from project description and project timetable*]	• Well-structured website well-equipped with information established • One promotional event with 100 participants held in November 2019	HS MU
Output 1.5: Industrial Energy Data Management Framework developed	Extent to which the Framework is developed (score of 0 to 4)	Output implementation was put on hold throughout the project	HU
Output 1.6: Assessment of Climate Technologies potential in industry	No. of Government led needs assessments for climate technologies for the manufacturing sector (*no target defined*)	End 2019: Collaboration with UNDP-GEF project; Industry data provided to support "Industry Study - Analysis of Measures and Policies; Assessment study ongoing at the time of evaluation.	MU
Output 1.7: Strengthened technical capacity of Macedonian institutions responsible for developing, implementing and monitoring energy efficiency and climate change mitigation policies and programs and public officials trained	Increased capacities of Macedonian institutions strengthened; No. of public officials trained: 25	2-day Workshop in Art. 7, 8 and 16 of the EU EED (April 2017); attended by 10 public officials; EnMS User training April 2019: 7 public officials; EnMS Expert trainings: 3 public officials; total number of public officials trained: 18 (some officials attended several trainings.	S

Note: *Italic font* indicates remarks or changes made by the evaluation team based on the project document.

Outcome 2: Adoption of energy and environment management systems leading to greater resource investments in energy efficiency measures and low carbon technologies, an increased energy productivity and competitiveness of the Macedonian industries

Output 2.1 aimed at training 50 local energy efficiency and environment professionals (of which 30 professionals in the EnMS training program and 20 in the CASO and SSO programs) in its Expert training and capacity building programmes. In total, 70 professionals were trained, of which 68 passed the exam. The target of this Output was thus strongly exceeded and thus rated as highly satisfactory.

Output 2.2 had the objective to support at least 15 enterprises in implementing EnMS (in line with ISO 50001) through its Expert Training and Support Programme. At the end of the project, 20 enterprises (of which eleven were pilot enterprises and ten replicating companies) across various branches (power generation, construction material, chemicals/pharmaceutical, steel, automotive, food and beverage, mining, textile manufacturing, health) as well as the Ministry of Economy have received support by the project to implement EnMS through training and support during the practical periods. An additional six companies/organizations participated in the EnMS Expert training programme but did not use substantial project support to implement EnMS. The target of this output was exceeded and is thus rated as highly satisfactory.

Under **Output 2.3** it was planned that partner enterprises would implement at least ten low-cost energy efficiency projects and invest at least USD 1 million during and as a result of the participation in the Expert training and support programme. Technically, this Output should be split into an Output and an Outcome part, distinguishing between the projects implemented within the Expert training and support programme and projects implemented afterwards (without support of the project). Unfortunately, the data does not allow for that distinguishment so that the total number of measures and related investments shall be reported here.

The final reports on the implementation of EnMS (which include technical measures in CASO and SSO) (available for 15 of the 20 partner enterprises) and data from the final industry survey (16 participating companies) suggest that about 170 measures (mostly technical and – more rarely in an estimated 10-20% of the reported cases – behavioral/organizational measures) were implemented in 14 companies. It should be noted however, that the reported measures varied strongly in terms of energy savings (from the replacement of lighting with comparably small savings over the exchange of electric motors to the replacement of major production equipment with very large energy savings).

The 15 reporting companies reported total capital investments for the IEE measures of about USD 2.6 million[6]. Note that five out of the 15 reporting companies did not provide data on capital expenditures for the reported measures. Thus, it is possible that the actual total investments exceed the reported total investments.

The target achievement of this output is considered to have been clearly exceeded and is thus rated as highly satisfactory.

Under **Output 2.4**, five enterprises should receive support by the project to bring them to the implementation stage of integrating ISO 50001 and ISO 14001. The implementation of the EnMS-ISO 50001 pilot programme showed however that it was not recommendable (and to great extent not feasible) to push enterprises undertaking the integration of the two certification systems. The project thus decided to promote and support EnMS-ISO 50001 implementation in five new enterprises,

[6] A large individual investment by a company amounting to USD 2.3 million was not considered, as it was implausible that this investment would be implemented in the reporting period due to long lead times that would be typical for such an investment. Another reason for exclusion is that the energy savings triggered by this investment amounted to only about 5000 kWh, which is negligible given the high energy consumption of the machine in question.

additional to those the ten originally planned for Output 2.2. For progress and results, please refer to the discussion of Output 2.2. Achievement of this Output is thus not rated.

Output 2.5 aimed at raising the awareness for the benefits of EnMS of higher management of at least 50 companies in half-day seminars. Instead of offering separate half-day seminars, the project opened the two-day EnMS User trainings for managerial staff. These EnMS User trainings were implemented in cooperation with USAID in the context of their "Macedonia Industrial Management Project". The UNIDO project provided its own training material of the EnMS User trainings and held one training together with USAID. Afterwards, USAID replicated these trainings five times under its own responsibility, targeting small and medium-sized companies. According to the project implementation reports by UNIDO, over 140 industry managers and personnel from more than 90 companies have participated in these User trainings. Unfortunately, documentation is insufficient to verify how many participants of the five USAID trainings were from the higher management level. But at the training, which was carried out by UNIDO and USAID together, there are lists of presence that allow to identify 25 higher management staff. Although it is possible that the target was reached with the five subsequent USAID trainings, the achievement of this Output 2.5 is rated as moderately satisfactory since sufficient evidence is missing.

Output 2.6 had the objective to train at least 100 personnel of at least 50 enterprises in EnMS and ESO User trainings. The available records show that in the ESO User trainings alone, there were 113 participants from 70 different companies. The achievement of this Output 2.6 is thus rated as highly satisfactory. As discussed in the paragraph on Output 2.5 hereabove, it is unfortunately not possible to estimate exactly how much non-managerial staff attended the EnMS User trainings.

In the project's results framework, the targets for **Outcome 2** were not explicitly defined in the respective table but could be derived from the Output level description and the description of the project approach in the project document. According to this information it was envisaged that ten enterprises should implement EnMS in line with ISO 50001 and ten low-cost energy projects should be implemented with investments of at least USD 1 million. Regarding the implementation of EnMS in line with ISO 50001, it can be stated that all 21 enterprises/organizations participating in the training and support measures under Output 2.1 have assessed their energy saving potential using EnMS in line with ISO 50001. However, in the final industry survey six of the 14 responding companies indicated that they are not implementing EnMS anymore. On the other hand, as of 10 August 2022 the following six partner enterprises have been third-party certified to ISO 50001 at their own cost: Vardar Dolomit, Makstil, Adient, Pivara Skopje, EVN Macedonia, and Usje Titan. Five companies indicated in the final industry survey that they are still implementing EnMS and are pursuing certification soon (of which two indicated a concrete date for certification in the next one or two to three years). It can thus be concluded that the target of ten companies was achieved but that there are also some hints that certain companies have given up on following the EnMS approach in the meantime. As already mentioned under Output 2.3 above, companies have reported investments of USD 2.6 million, thus the target of USD 1 million was also widely exceeded. Besides defining outcome targets for the target group industry, the results framework also mentions that IEE service providers (i.e., the national IEE consultants) would continue to offer consultancy services, but no specific target was set. In the online survey among local EE consultants which have been trained in the project 15 (out of 19 respondents), said that they currently (July 2022) offer or apply their expertise in the following capacities in EnMS, CASO and/or SSO (as freelance consultant: three; as employee of a consultancy firm: three; as employee in the industry (public or private company): ten; in other capacities: two (of which in academy: one and sales and service of compressor equipment: one). Four respondents said that they are currently not working as expert for EnMS/SSO/CASO/IEE. It is noticeable that the majority apply the knowledge as employees in industry and the proportion of those who offer services to industry is smaller. This is probably because the IEE market for external industry service providers is still in the

development phase. Due to the recognizable fact that people trained by the project are still professionally involved with the topic of IEE today, this indicator is still rated as achieved despite missing target setting by the project.

The overall rating for the achievement of Outcome 2 is highly satisfactory.

Table 3: Programmed outputs and Outcomes, indicators and target and achievement rating of Component 2

Programmed Outcomes and Outputs	Indicators and targets	Status of target achievement	Rating
Outcome 2: Adoption of energy and environment management systems leading to greater resource investments in energy efficiency measures and low carbon technologies, an increased energy productivity and competitiveness of the Macedonian industries	• Ten (10) enterprises from key Macedonian industrial sectors implement Energy Management Systems in line with ISO 50001.	• In total, twenty enterprises and MoE have implemented an EnMS in line with ISO 50001. Six (6) partner enterprises have been third-party certified to ISO 50001 at their own cost (Vardar Dolomit, Makstil, Adient, Pivara Skopje, EVN Macedonia, and Usje Titan). Six (6) of 14 responding companies in the final industry survey 2022 indicated that they are not implementing EnMS anymore. Five (5) companies indicated in the survey that they are pursuing certification.	HS
	• At least ten (10) low-cost energy efficiency projects are implemented by industrial enterprises as result of their participation in the Training programs of the project. Resources invested in EnMS/ ESO/ EE implementation [*target: USD 1 million]*	• 170 measures reported by 14 companies (note that measures vary considerably in size) and USD 2.6 million in capital investments reported.	HS
	• No. of EE service providers offering EnMS and ESO services [*no target set*].	• 15 of 19 respondents in national expert online survey currently apply their expertise in EnMS and/or ESO in their professional life. Due to the recognizable fact that people trained by the project are still professionally involved with the topic of IEE today, this indicator is rated as achieved although a target was not defined by the project.	S
Output 2.1: A group of 50 local energy	• Group of 50 local energy efficiency and	• Total: 70 professionals trained, of which	HS

Programmed Outcomes and Outputs	Indicators and targets	Status of target achievement	Rating
efficiency and environment professionals are equipped with the technical expertise and tools required to: **i.** Implement in industry Energy Management Systems (EnMS) in line with ISO 50001 **ii.** Carry out industrial energy system optimization assessments **iii.** Train industry personnel in EnMS and energy system assessment & optimization **iv.** Offer EnMS, energy system assessment & optimization technical services to industry	environment professionals trained (of which 30 professionals in the EnMS training program and 20 in the CASO and SSO programs). • No. of women EE consultants/service providers trained [Target: At least 20% women]	68 qualified: (EnMS: 42 persons qualified; SSO: 11 persons qualified; CASO: 15 persons qualified, and 2 persons trained.) • Of the 70 trained professionals, a total of 22 persons (31%) were women.	HS
Output 2.2: Enterprises from key Macedonian industrial sectors have received support from the project to develop and implement EnMS (in line with ISO 50001) in the frame of the EnMS Expert trainings	At least fifteen (15) enterprises, (*The target was raised to 15 enterprises in compensation for the fact that Output 2.4 was no longer pursued. For more details, please refer to Output 2.4 below.)*	20 enterprises (of which eleven (11) were pilot enterprises and ten (10) replicating companies) trained.	HS
Output 2.3: Low-cost energy efficiency projects are implemented by industrial enterprises as result of their participation in the training programs of the project.	At least ten (10) low-cost energy efficiency projects are implemented by industrial enterprises	170 measures reported by 14 companies	HS
Output 2.4: Enterprises have received support by the project to bring them to the implementation stage of integrating ISO 50001 and ISO 14001	At least five (5) enterprises supported	N/A (Integration found to be not recommendable and feasible. Decision taken to promote and support ISO 50001 implementation in 5 new enterprises, additional to those of Output 2.2.)	N/A

Programmed Outcomes and Outputs	Indicators and targets	Status of target achievement	Rating
Output 2.5: Top management of enterprises understands the economic and environmental benefits of energy efficiency and is made aware of key relevant commercial best-available practices and technologies.	• Managers of at least 50 companies. • At least 20% of participants are women.	• Managers were invited to EnMS User trainings (Op. 2.6). Management participation could only be verified for joint user training with USAID (22-23 June 2016): 25 managers of 21 companies. According to PIR 2021, ca. 140 persons from 90 companies were reached (number could not be verified). • Data incomplete.	MS Not rated
Output 2.6: Personnel of fifty (50) enterprises receive training on the implementation of energy management systems and on energy system optimization measures.	• At least 100 personnel of at least 50 companies participating in 2-day trainings on the implementation of EnMS and ESO. [Target further specified based on project document.] • At least 20% of participants are women.	• SSO: 52 participants from 32 companies/organizations (3 trainings); CASO: 61 participants from 38 companies (1 in-class and 1 online training). Insufficient data on the attendance of the EnMS User trainings. • Data incomplete.	HS Not rated

Note: *Italic font* indicates remarks or changes made by the evaluation team based on the project document.

Outcome 3: Adoption of energy efficient and low carbon process/ sector specific technologies

Outputs 3.1 and 3.4 aimed at developing and establishing financial mechanisms for technical assistance for the preparation of bankable IEE investment proposals for loan applications (Technical Assistance Facility (TAF); Output 3.1) and offering a post-implementation reward in the form of a Performance-based Cash Incentive (PCI; originally called Performance-based Reward Mechanism) mechanism (Output 3.4).

Both outputs made progress only towards the end of the project (i.e., from 2021), the implementation of the TAF/PCI was ongoing at the time of this evaluation. Originally, both the TAF and PCI mechanism were to be set up at the beginning of the project to support the financing of IEE investments identified in the project, if possible. According to the Progress Reports, the preparation of TAF and PCI was supposed to start in the first quarter of 2016. While meetings and exchanges with the MBPD to review the TAF and PCI design and set-ups did take place, they did so without decisive progress until the second quarter of 2019 (in 2016 and 2017 due to the Government crisis in the country). It was not until May 2019, that there was a little progress in that a financial expert was hired to implement the output and initial discussions were held with banks. However, the onset of the COVID 19 pandemic at the beginning of 2020 ultimately led to the MBPD's withdrawal as a partner from the project due to the decision of the Government to repurpose the USD 4 million available to MBPD for sustainable energy investments to Covid-19 relief measures for businesses, and the need to look for an alternative solution.

The solution was that the funding for TAF and PCI was provided from project funds until they are exhausted.[7] It is true that this can demonstrate the operation and potential impact of this type of financial incentives. However, the - ultimately not possible - anchoring of these mechanisms in a suitable North Macedonian institution such as the MBPD could have made access to local banks easier.

At the time of this TE, the TAF and PCI were operational, and detailed information about the modalities of operations, terms, conditions, and eligibility criteria were accessible through the IEE BPID website. Further to this, promotional and information webinars were also held. As of July 2022, a total of six funding applications have been received, five of them were in the assessment process, and one of the applications was accepted and achieved the closure of an IEE loan agreement with a commercial bank.

Due to the long delay in implementation, the achievement of these outputs is rated as moderately satisfactory.

Outputs 3.2 and 3.3 were dedicated to the training of 15 national IEE consultants about IEE investment proposal preparation and 15 bank lending officers about the assessment of these proposals. The training for consultants took place on 22 and 23 July 2021 and was attended by 17 consultants.

The training for bank lending officers was held on 12 August 2021 and was attended by 10 persons. It should be noted that this training was originally intended to train bank lending officers on the assessment of IEE investment proposals in a 2-3 day workshop. The shorter one-day training then introduced the audience to the TAF/PCI financial scheme only. In an interview with one bank, the bank confirmed that a specific training on the assessment of IEE proposals would not have been relevant to the bank since such (larger) investments would be standard business in banks and it would not matter much if such (larger) investments were made as the result of considerations in the context of increasing energy efficiency or any other cause. The evaluation team considers this plausible and the change in

[7] The TAF/PCI incentive scheme is operated responsibly by REC North Macedonia with technical support from PointPro Consulting. Such a set-up with an external operator of the incentive scheme would also have been likely since MBPD did not have own capacities to technically implement the TAF and could not receive PCI funds because of associated high transaction costs.

the training objective logical (and useful for promoting TAF and PCI).

Achievement of these Outputs is rated as highly satisfactory.

On the outcome level, the project had the objective that companies would use funding of the TAF/PCI to make IEE investments mobilizing loans from MBPD or other banks (MBPD had pledged USD 3million according to the respective co-financing letter). To date, only one investment has been made with a five-figure dollar amount. Considering the possibility that a total of USD 800,000 or more may be mobilized with the help of the TAF/PCI incentives in the future and comparing this with the planned mobilization of loans of USD 3 million as pledged by the MBPD, the achievement of Outcome 3 is rated as unsatisfactory.

Table 4: Programmed outputs and Outcomes, indicators and target and achievement rating of Component 3

Programmed Outcomes and Outputs	Indicators and targets	Status of target achievement	Rating
Outcome 3: Adoption of energy efficient and low carbon process/ sector specific technologies	Investment mobilized through MBPD or other local banks *[No Component specific target defined*; *however MBPD had planned to lend out USD 3 million as per its co-financing pledge which will be used as a reference here.]*	One company was awarded with TAF/PCI incentive. Loan provided amounts to USD 71,000. There is a possibility that at least USD 800,000 may be levered in the future as the PCI awards USD 1 on top of 4 USD spent by companies for IEE measures (the PCI funding amounts to USD 205,000).	U
Output 3.1: Technical assistance facility (TAF) to support IEE investments **Output 3.4**: Performance-based cash incentive (PCI) mechanism for IEE investment projects established	• TAF/PCI mechanism is developed and operational	• TAF/PCI developed in the last project year with considerable delay, pilot implementation ongoing (by REC and PointPro)	MS
	• No. of applications received [*no target defined*]	• Six (6) applications received	Not rated
	• No. of incentives/rewards granted [*no target defined*]	• One (1) TAF/PCI application accepted	Not rated
Output 3.2: Local EE consultants trained in IEE investments preparation	• At least fifteen (15) local EE consultants attending	• The training on 22 and 23 July 2021 was attended by 17 consultants.	HS
	• At least 20% of participants are women.	• Four (4) of participants were women (24%).	HS
Output 3.3: Bank lending officers trained in assessing IEE investments proposals	• At least ten (10) bank lending officers attending	• The training on the TAF/PCI financial incentives on 12 August 2021 was attended by 10 participants.	HS
	• At least 20% of participants are women.	• Four (4) participants were women (40%).	HS

Note: *Italic font* indicates remarks or changes made by the evaluation team based on the project document.

Overall, the project's effectiveness is still rated as satisfactory due to the satisfactory results of Component 1 and the highly satisfactory results of Component 2. Component 3 was weighted lower than the other two components because, from the evaluation team's point of view, it is less important for the overall success of the project than the other two components.

The rating for project effectiveness is "satisfactory".

2.2 Progress towards Impact

Environmental benefits (energy and GHG savings)

At the project objective level, the project has set itself the goal of saving a total of at least 133 kilotons carbon dioxide equivalents ($ktCO_{2equ}$), of which at least 67 $ktCO_{2equ}$ should be accounted for by direct savings and 66 $ktCO_{2equ}$ by indirect savings. In the following, the direct savings will be reviewed first.

Direct emission reduction calculations were made exclusively on the basis of reporting by the partner companies. This means that no estimates were made for non-reporting partner companies. Partner companies essentially reported twice: once as part of the final reports on EnMS measures immediately following the Expert Trainings and EnMS implementation support, and once as part of the final industry survey 2022, in which companies also reported later measures after participating in the project's EnMS implementation support. It is important to note that the actual implementation of the measures could not be verified by the project, and also not within the framework of this evaluation. However, since most of the companies provided quite detailed information on the individual measures and, in some cases, documents such as photos or information in company presentations were also available, the information provided appears to be quite plausible.

In calculating the savings, an average lifetime of seven years was assumed for the individual measures, as standard values for measure lifetimes are either not available in the literature or, if available, are highly contradictory. Based on these assumptions, the evaluation team calculated that a total of approximately 183 GWh of electricity, 34 GWh of natural gas, and 4 GWh of oil or diesel were saved. Applying the appropriate emission factors and adding the CO2 savings from a company that reported no energy savings but did report emission reductions, it was calculated that the direct savings were 377 $ktCO_{2equ}$. The target of 67 $ktCO_{2equ}$ was thus exceeded by a factor of about five to six. However, it should be considered that one company alone represents about 75% (282 $ktCO_{2equ}$) of these savings[8].

Regarding indirect emission savings the project planned to save another 66 $ktCO_{2equ}$. According to the calculations carried out during the project preparation phase, Components 1 and 2 would cause 17.6 $ktCO_{2equ}$ emission reductions and Component 3 another 38.9 $ktCO_{2equ}$. Since the main objective of Component 3 (to provide significant financing in the form of loans) was not reached, the conclusion would be that only 17.6 $ktCO_{2equ}$ of indirect emission reductions would be achieved. However, as the project showed, even without loans with preferential conditions available, a high number of measures were realized that materialized significant savings. It is thus estimated that with the EE Law enacted and the implementation of the Rulebook on the Energy Audit of Large Enterprises this year, companies will have a relevant incentive to implement EnMS and ESO measures which makes it likely that indirect emission savings in the order of magnitude of the direct savings can realistically be achieved.

Economic benefits

Reporting of the partner companies not only covered energy and GHG emission savings but also investments and energy cost savings. The companies reported that they have invested USD 2.6 million

[8] The evaluation team cross-checked this data with information published on this company's website and found that the reported data can be considered as plausible.

(it should be noted that of the 14 reporting companies, five never reported investment costs, and three only partially, so that investments may be higher). Assuming again an average lifetime of seven years for the reported measures, the reported energy cost savings amount to a total of about USD 17.7 million. The company which has reported the highest GHG emission reductions (see the paragraph hereabove) has saved USD 6 million.

The overall rating for progress towards impact is "highly satisfactory"

3 Project's quality and performance

3.1 Design

3.1.1 Overall Design

The project approach builds on a thorough analysis of the framework conditions, prerequisites and needs in Northern Macedonia. Accordingly, measures have been proposed to address the challenges related to IEE in an appropriate way. For example, the policy field analysis recognized that policy-making in the field of energy efficiency is still very much focused on buildings and that IEE, although mentioned as an important aspect in the field of energy efficiency, still played a very minor role in its concrete design. The project has recognized this gap and planned a corresponding comprehensive addition to the legal framework.

Component 1 has a very balanced design: On the one hand, this component aimed to ensure that clear legal requirements emerge for large companies in terms of energy management and auditing. Moreover, this was done in a way that not only supported legislation at the top level, but also looked at the necessary ancillary regulations that are important for the enforcement of the law (Rulebook on Energy Audits for Large Enterprises and the regulations on requirements and implementation of EnMP training). In addition, the project was not only concerned with binding regulation, but also with the creation of additional financial incentives for industry to address the issue of energy management and ESO. This includes not only the financial incentive for ISO 50001 certification (Output 1.3), but also the planned creation and demonstration of the TAF and PCI financing mechanism under Component 3 (Outputs 3.1 and 3.4), which provide financial and technical support to companies in preparing loan proposals (TAF component), but also create another performance-based additional incentive to implement the measures (PCI component). Component 1 planning also included Outputs 1.5 (Industrial Energy Data Management) and 1.6 (Climate Technologies Potential Assessment), two additional measures that are highly relevant to government capacity building in the areas of climate reporting and strategic energy efficiency planning. These two outputs are also interesting because they bridge to Component 2, where a lot of data on energy savings was collected from companies and EnMS and ESO solutions were concretely implemented as part of the implementation of the EnMS and ESO measures. Component 1 was rounded off not least by complementary training measures (Output 1.7), which offered the opportunity to provide public officials with targeted training on selected topics as needed. All measures can be certified as being highly feasible, not least because they were very much based on existing legal and regulatory initiatives and frameworks, but also on tried-and-tested approaches.

Component 2 forms the core of the project. It is clearly focused on industry and serves their capacity building needs in an appropriate way. Building on experiences from previous UNIDO initiatives (e.g. in the Republic of South Africa), a very practical and results-oriented approach was chosen with the EnMS and ESO Expert Trainings. The greatest strength of the Expert Training approach chosen is its strong orientation towards analyzing and solving real energy efficiency problems in industry. In this way, companies can achieve concrete results with the support of the project, which in turn can be used as positive practical examples for other companies. Furthermore, the approach to pair up external IEE

consultants with the industry ensures that newly gained knowledge and practical know-how have a chance to be replicated in other contexts. To provide technical support to the enterprises and consultants between the theoretical training sessions was certainly important to ensure the delivery of concrete and tangible progress (and certainly to also avoid potential frustration during these implementation phases). With this approach, it could be ensured that the main target group, i.e., technical staff, would be enabled to independently continue their energy management work in the future. But project design also recognized the relevance of higher-level management in energy-related decision-making and thus foresaw trainings for this target group. In these trainings, the case studies that were to be developed in the context of the expert trainings were to play a role in order to be able to do credible persuasion work. Also, in this Component 2, Output 2.6 provided the opportunity for further interested groups of people who cannot or do not (yet) want to deal with the topic in depth to gain an initial insight into the topic via the EnMS User and ESO trainings.

Component 3 complements Component 2 in the planning in a suitable manner and addresses the facilitation of the financing of IEE investments. In particular, both sides involved, i.e., investing companies and financing banks, should be trained in the preparation of corresponding loan applications and their assessment. According to the plan, this was to be done as part of the implementation of the IEE projects supported in Component 2, in order to create concrete experience and examples here as well. Since it was expected that the need for technical support in the preparation and evaluation of IEE loan applications would continue, the Technical Assistance Facility (TAF) was to be established to ensure that the required technical support could also be provided after the end of the project. Here, too, the planning shows how the various results are interlinked: the national IEE consultants trained in Component 2 and further trained in the preparation of loan applications were to provide consulting services that were to be supported by the TAF. Component 3 was intended to establish a performance-based financial reward mechanism to create an additional monetary incentive for companies to invest in IEE projects. The financial component, however, was less important, as the project primarily aimed to leverage the potential of industrial energy efficiency at the no-cost or low-cost level.

As the analysis of the design of the three components shows, the level of integration of all measures and thus the internal consistency is very high: The policy component sets necessary mandatory incentives to engage with EnMS, the training component creates sustainable knowledge and know-how to implement the policy requirements, and the third component enables stakeholders from industry and the banking sector to prepare IEE projects for financing.

All planned measures and results had a high level of ambition against the background of the given resources (e.g. the adoption of new legal bases, the implementation of EnMS and ESO measures in companies or the institutionalization of a TAF/PCI), which also - assuming the cooperation of the partners, of course - seems achievable. At the same time, the measures were planned very pragmatically, that they had a good chance of being implemented. This pragmatism can be seen, for example, in the fact that the approach to expert training was based on an approach that had already been successfully tested, or in the fact that the project was able to dock onto the ongoing efforts of North Macedonia as a Contracting Party of the European Energy Community Treaty when drafting the legal regulations for IEE and to take up legal approaches introduced in the EU.

3.1.2 Logframe

As already discussed in section 3.1.1, the project had a well comprehensible and logically well-thought-out structure. This structure is also largely reflected in the Project Results Framework, although it can only be fully understood in part when viewed together with the description of the project approach in the project document.

Delineation of outcomes and outputs

One problem in the Results Framework was that outcome and output indicators were not clearly delineated. Outputs are typically defined as tangible product and services produced by the project and outcomes the behavioral changes as a result of the outputs (Morra-Imas and Rist 2009). From this definition, it can be derived that results on the output level are what a project has complete control over, but naturally, behavior change is a desired goal, but not one that a project can fully control. This delimitation was not followed stringently in the Results Framework, so that there were overlaps. However, this rather methodological problem did not have a strong negative impact on the comprehensibility of the results framework. For the purpose of this evaluation, this demarcation of outputs and outcomes could be made subsequently without distorting the intended message of the original logframe.

Indicators

The impact indicators only refer to direct and indirect greenhouse gas savings and furthermore only pick up on the proportion of women participating in trainings and other events. A more precise description of the desired effects would have been useful here. For example, in addition to the target of GHG emissions saved, a target for energy savings should also have been defined (especially because electricity in particular is becoming increasingly de-carbonized in Northern Macedonia, which means that GHG emissions savings lose some of their significance). Furthermore, in addition to environmental impacts, UNIDO aims at further impacts in the following domains: Institutions and policies, economic performance of enterprises and institutions, and human and social capital and empowerment. Although progress in these areas was evident from the project results, it would have been desirable if the project had described its objectives in these domains in more detail.

As discussed above, there is the technical problem of clearly delineating Output and Outcome indicators in the logframe, which will be briefly summarized below:

- Component 1: The enacting of legislation, regulation and incentives should have been placed on the outcome and not the output level (relevant for outputs 1.1-1.3).
- Component 2: Although the implementation of EnMS or the implementation of low-cost energy efficiency projects was clearly strongly related to the Expert Trainings and related support, the decision to actually implement these was in the realm of the partner enterprises and should have been placed on the outcome level (relevant for Outputs 2.1 – 2.4).
- Component 3: The establishment of the TAF and PCI mechanism in an external institution cannot be fully controlled by the project and should thus have been placed in the outcome level.

This approach would have made the transition from immediate project results to desired change clearer. However, the intended goals at the outcome level were nevertheless still easily recognizable retrospectively.

The Output indicators used are quantitative, on the one hand by indicating a measurable numerical quantity (for instance number of companies or people or money invested), on the other hand by using rating scales. The rating scales (with scores between 0 and 4) were mostly used when the extent to which a qualitative objective is to be achieved is to be expressed (for example to what extent a regulation has been adopted and enforced). Unfortunately, the meaning of the respective scales is not defined, target values are missing and some scales are also applied to actually clear numerical values. This kind of use of scales without target setting and clear definition creates a certain room for interpretation, preventing a clear measurement and statements on the achievement of targets.

Furthermore, it was checked to what extent the indicators were SMART. Due to the lack of clear Outcome indicators, only the Output indicators were considered. The Output indicators used were either quantitative (e.g., number of participants in trainings or events) or binary (yes/no; where scales with a score of 0-4 were placed in this group). However, the validity of some output indicators could have been strengthened by supplementing them with qualitative indicators. For example, mere participation in trainings or events still says little about their quality or achievement of learning objectives. Post-training surveys would have been a simple way to obtain interesting findings here (which would also have been in the spirit of a permanent improvement process during project implementation).

The rating for the project design is "satisfactory".

3.1.3 Monitoring and evaluation, and risk analysis at design stage

For Monitoring and Evaluation (M&E) the project had foreseen a budget of USD 64.000 (of which USD 24.000 were to be covered by the GEF, USD 30.000 by UNIDO and USD 10.000 as in-kind contribution by project partners). The budget was reserved to annual project reporting, a mid-term-review, the Final Project Evaluation and the Terminal Project Report. The share of the planned overall budget of USD 54.000 (without in-kind contribution) compared with the total project grant amount of USD 1.4 million is four per cent which is the typical and appropriate size for the M&E budget.

The M&E Plan in the project document was rather short and lacked detail about the concrete planned M&E activities. It can be assumed, however, that the project would have to comply with given reporting standards of UNIDO, so that this short description would not pose much of a problem. Nevertheless, there are indicators for energy and greenhouse gas savings that are not only important for fulfilling reporting obligations and monitoring progress but can also be useful for communicating project benefits to the professional public or in the context of UNFCCC reporting. While the project has collected relevant data from partner companies at certain intervals, it has done so only partially in a consistent and regular manner. A discussion of the challenges in this data collection in the project planning phase might have already provided impetus for a more systematic data collection here. (The identified challenges in data collection are discussed in more detail in section 5.1.).

The project document contains a risk analysis with a risk description, an assessment of the risk level and mitigation measures for the risk categories "Institutional risks", "Policy and regulatory risks", Technological Risks", "Market risks", and "Economic and Financial Risks". The evaluation team considers the risk level assessments, though short and lacking in some detail, as generally appropriate and the proposed mitigation measures logical.

3.2 Relevance

Relevance for the North Macedonian Government

The project was highly relevant for the North Macedonian Government as it contributed to the fulfilment of several energy-related programs and strategies of the country. The central strategy document at the time of project preparation was the 2nd National Energy Efficiency Action Plan (NEEAP), which was available as a draft at the time. According to the project document (the original NEEAP was no longer available to the evaluation team), this draft had a strong focus on promoting energy efficiency in the public, commercial and industry sectors. Specifically, the introduction of energy management systems was to be promoted in these sectors. Furthermore, measures to optimize process heating and motor-driven systems should be introduced in industry. According to the 2nd NEEAP, a network of industrial companies, experts and other relevant stakeholders should be established to implement these measures by accelerating the introduction of appropriate approaches and technologies through mutual learning and information. The proposed project, with its approach

of Expert Trainings and Technical Support, started at exactly this point.

Another Government document valid at the time was the "Strategy for Improvement of Energy Efficiency in the Republic of Macedonia until 2020" adopted in 2010. This document devotes a separate chapter to the industrial sector. This strategy already discusses the topics of mandatory energy auditing, best available technologies and the focus of policy measures on energy-intensive plants and processes.

Furthermore, the project fills a gap that still existed at the time with regard to the lack of rules for energy audits in industry. Although rulebooks on the energy performance of buildings and energy auditing of buildings already existed at the time, corresponding rulebooks for the industry sector were still missing. The project addressed this gap through the planned development of rules for the use of energy management practitioners (de facto energy auditors) and was eventually able to fill it.

Relevance for GEF objectives

This is a GEF-5 Climate Change Mitigation (CCM) focal area project. As planned, designed, and implemented, the project provided support in three key areas: 1) policy, regulatory and institutional frameworks, 2) technical capacity building supporting the IEE market development, and 3) IEE financial capacities. Targeting these three key areas, the project is addressing the respective barriers for sustainable industrial energy efficiency in Macedonia, thus contributing to the CCM Strategic Objective 2 “Promote market transformation for energy efficiency in industry and the building sector”.

Relevance for UNIDO’s objectives

Article 1 of the Constitution of the United Nations Industrial Development Organization defines as its primary objective “the promotion and acceleration of industrial development in [the] developing countries” and the promotion of “industrial development and co-operation on global, regional and national, as well as on sectoral levels”. The evaluated project is fully aligned with this objective as it promotes energy efficiency in industry, which is crucial for enhancing competitiveness through innovative approaches and technologies. The project is furthermore highly consistent with UNIDO’s long-term strategy of Inclusive and Sustainable Industrial Development (ISID) which was adopted in 2013. According to the Strategy UNIDO shall work towards creating shared prosperity, advancing economic competitiveness, safeguarding the environment, and strengthening knowledge and institutions. The present project approach clearly contributes to these four pillars as it helps increasing competitiveness of the North Macedonian industry, contributes to greenhouse gas and other pollutant’s emission reductions, transfers know-how and knowledge to people and build capacities of institutions and last but not least helps building an industry sector from which North Macedonian citizens can benefit directly and indirectly.

The rating for relevance is “highly satisfactory”

3.3 Efficiency (including co-financing)

Budget spending

The total project budget was USD 7,304,628. Of this, the GEF grant was USD 1,400,000 and the co-financing contributions amounted to USD 5,904,628. With regards to the grant amount, Component 2 had the largest share (USD 620,000), followed by Component 3 (USD 420,000) and then Component 1 (USD 231,000).

As of 30 June 2022 (the date of the financial closure of the project) nearly the complete GEF grant has been used, there is a small remainder of USD 8,323.35 (Table 5).

Table 5: Project budget and expenditures at the project's financial closure on 30 June 20

Project Component	GEF Budget (USD)	Expenditures as of 30 June 2022 (USD)	Expenditure Rate [%]
1. Strengthening Macedonian policy, regulatory and institutional frameworks, and capacity for market transformation for industrial energy efficiency and green industry.	231,000	227,269.02	98.38%
2. Market development support for deployment and diffusion of best available practices and technologies for energy efficiency and environmental sustainability in industry	620,000	618,269.57	99.72%
3. Enhancing existing financing facilities to boost investments in energy efficiency and low carbon technologies for industry	120,000	120,257.10	100.21%
	300,000 (Output 3.4; PCI)	298,747.04	99.58%
4. Monitoring and Evaluation	24,000	23,982.85	99.93%
Project Management Cost	105,000	103,151.07	98.24%
Total	**1,400,000.00**	**1,391,676.65**	**99.41%**

Given the satisfactory effectiveness and highly satisfactory progress towards impact with the available budget, the utilization of the budget to achieve results is rated as satisfactory.

Project timeframe

The expected project duration was 42 months, the actual implementation time was 88 months (March 2015 to June 2022; it should be noted that the work on Output 1.6 – Assessment of Climate Technologies was still ongoing and expected to be finalized in late autumn 2022, adding at least another three months to the total project duration), thus the project took more than twice as long as planned which is rated as moderately unsatisfactory since some of the delays were caused by external factors which could not be controlled by the project.

The evaluation team notices that the delays already built up at the beginning of the project. Certain activities under Component 1 (Best Practice dissemination Platform, Data Management Framework, Assessment of Climate Technologies) were only started after a considerable delay of two to four years, which could not be made up in the end. The available project reports justify these delays with the political crisis and the early new elections in 2016 and the subsequent difficult phase of forming a new Government in 2017. While it seems plausible that this could lead to certain delays, it does not entirely explain some further delays in 2018, 2019, and 2020. From the evaluation team's point of view, UNIDO and the PMU should have worked more vigorously to catch up with these delays at the latest after the government had regained its ability to act. Unfortunately, it is not evident from the project reports that, in addition to the negotiations conducted with the partner institutions, preparatory work took place that could have been carried out independently of the partner institutions (e.g., the design and

content preparation of the BPID website or conceptual preparatory work on the Climate Technologies Assessment). However, it shall be noted that these problems only related to some Outputs of Component 1 and that work on the EE Law and the associated regulation was taken up shortly after the government crisis and was implemented as quickly as it was possible.

Component 2, on the other hand, shows a different picture. The implementation of activities (mainly EnMS and ESO Expert and User trainings) started as planned in the first project year (2016). The implementation was then planned for two years. A large part of the activities (implementation of the trainings and implementation support in the areas of EnMS and ESO) with the pilot companies was already completed in the first two years. The replication phase started seamlessly in the second half of 2017 and was then gradually completed over two years until the end of 2019. Although this also meant that the plan to complete the trainings within two years could not be adhered to, the evaluation team considers the original plan to be very ambitious, as the intensive support of the partner companies is very time-consuming.

Component 3 is particularly affected by delays. Originally, this component was also planned to start in the first year of the project, as the idea was that partner companies should already benefit from the outputs (financial incentives and support in preparing loan proposals). Similar to Component 1, the government crisis in 2016 led to delays in the negotiations with the MBPD (where the anchoring of the TAF and the PCI mechanism was foreseen). However, even after that, i.e., from 2018 onwards, no significant progress could be achieved; ultimately, the MBPD withdrew its engagement from the project due to new prioritization as a result of the Corona pandemic in 2020, meaning that these financing mechanisms had to be set up elsewhere, as described earlier. However, given that little progress was made over two years until 2020, earlier intervention and a reassessment of MBPD's potential risk of default might have been advisable.

Input from donor

The financial inputs by the GEF and subsequently were provided as planned and were adequate to meet the requirements.

Co-Financing (inputs from counterparts)

Co-financing was planned to amount to USD 5,904,000 and comprised in-kind and partially cash contributions by UNIDO, the MoEPP, the MoE, the private sector (that is North Macedonian enterprises), the MBPD, USAID, the Faculty of Technology and Metallurgy of the University “Cyril and Methodius” and REC Macedonia. Actual co-financing at the end of the project amounted to about USD 4,347,422 (ca. 74% of the originally planned value), thus reaching a satisfactory level.

In the **private sector**, in-kind contributions relate to staff which is made available for the participation in Component 2, i.e., participation in the expert trainings, EnMS and ESO analyses and time for the implementation of identified measures. Cash contributions are resources required for the implementation of EnMS and/or ESO measures identified in the respective analyses done with the support of the project. Partner companies were asked to report their in-kind and cash contributions in their final EnMS reports and in the final industry survey 2022. Based on these, the evaluation team calculated that the companies had in-kind contributions of USD 63,105 (target: USD 197,260). However, the actual contribution is likely to be higher, but unfortunately, especially in the final industry survey, only six of the 15 participating companies reported their staff’s working time, although it is evident that these companies did implement EnMS and/or ESO measures.

With regards to cash contributions were also reported by the companies. According to this data, companies have mobilized about USD 2.6 million over the course of the period between 2016 and 2021 (target: USD 0.22 million), thus more than ten times the amount estimated in the beginning. Although

some of the investments may not be caused only by the project but also due to other consideration, the available date clearly suggests that partner enterprises clearly were willing to invest in measures identified during the project. Furthermore, it is possible that the TAF/PCI incentive leverages investments of another at least USD 800,000 in the future (the grant contribution amounts to 20% of the IEE loan amount up to a maximum of USD 25,000; the available fund for the PCI grants amounts to USD 205,000). So far, one company was awarded with the TAF/PCI incentive for a commercial loan amounting to USD 71,000.

For its grant contributions, **UNIDO** kept records for own expenditures from the Pre-PIF to the implementation stage of the project. According to these, UNIDO has spent USD 60,995[9] and thus slightly overspent its grant compared to the planned contribution of USD 60,000.

For its in-kind contribution, UNIDO provided resources with an overall value of USD 339,412 according to own reporting. This sum includes the provision of training material (USD 270.000), assistance with project review and final independent project evaluation (USD 3,500) and technical advice by the UNIDO project manager supporting the implementation of selected project activities (USD 65.912). The original planned in-kind contribution was USD 390.000.

Due to the withdrawal of **MBPD** because of the shift in priorities caused by the Corona pandemic, cash co-financing of the bank did not materialize. It is estimated that MBPD still had in-kind contributions of about USD 5,000 in the frame of negotiations with the project on the preparation of the TAF/PCI mechanism.

The contribution of the **Government Executing Partners** (MoE, Energy Agency of the RNM, MoEPP) can only be discussed qualitatively since these partners are typically not reporting actual contributions. At the project preparation stage, all government executing partners pledged to contribute to the fulfilment of the project's outputs and outcomes. In the project document, the roles of these partners can be clearly derived: The **MoE** was a key partner to ensure the preparation and implementation of energy efficiency related legislation and regulation (Energy Efficiency Law and related regulation regarding EnMP Certification as well as the provision of financial incentives for ISO 50001 certification). Related outputs and outcomes were achieved in very close cooperation with the MoE, so that a very strong ownership and commitment by this Ministry can be clearly ascertained. It can be highlighted here as well that the MoE has allocated grant funding to support ISO 50001 certification (besides other certifications) within its "Programme for Competitiveness, Innovations and Entrepreneurship". Between 2017 and 2021 this Programme was endowed with funds of USD 320,600 (accumulated total). By mid-2021, two companies have received grants amounting to USD 7,600 (the maximum subsidy per company is USD 3,800).

The same can be stated for the **Energy Agency of the RNM**. The Energy Agency has, as planned, integrated the IEE BPID website on its own website and continues to operate it. Furthermore, it is the institution which is mandated to initiate and supervise the implementation of the future EnMP trainings and thus plays a key role not only in initiating this process but also to maintain it.

Regarding the **MoEPP**, the picture is less clear. In terms of content, the MoEPP was mainly invested in the outputs on the assessment of climate technologies in industry (Output 1.6) and the development of the Industrial Energy Data Management Framework (contributing to UNFCCC reporting; Output 1.5). As discussed above, there were, however no tangible results from the implementation of the Data Management Framework. Then, the Assessment of Climate Technologies was initiated by the project only towards the end of the project, and the MoEPP stated in the interview that it had hardly been involved in the preparations of this output. Overall, the evaluation team found in its research that the

[9] An average exchange rate of USD 1.15 for 1 EUR was assumed. (Expenditures were reported in EUR.)

two outputs were pursued with little emphasis in the project, with correspondingly weak or very delayed results. From the evaluators' point of view, a good opportunity was possibly missed here to advance tasks relevant to international climate reporting and to lay further foundations for the targeted promotion of industrial energy-saving techniques and approaches. Regarding co-financing, it can only be concluded that the corresponding contribution on the part of the MoEPP could only materialize to a very limited extent. It is recommended that in possible follow-up initiatives, an even closer exchange between the project and the MoEPP should be sought in order to ensure that the project measures can contribute to MoEPP objectives to the best possible extent.

Of course, all government executing partners were part of the Project Advisory Committee and all contributed to the discussions in this board.

The **USAID** "Macedonia Industrial Management Project" teamed up with the UNIDO project already during project preparation. USAID committed itself to provide an in-kind contribution of USD 550.000. This contribution encompassed the implementation of six EnMS User trainings as well as of measuring equipment (including software) that could be used in the energy consumption analyses in the UNIDO project's partner enterprises. Unfortunately, there is no record of the actual contribution by USAID. But it is evident that the six EnMS User trainings were implemented in partnership between the two initiatives and in the interview held with a representative of the UNIDO project (from the consultancy firm TimelProekt) it was credibly explained the measuring equipment funded by USAID had been used to support the analyses of the UNIDO project.

The **Faculty of Technology and Metallurgy of the University "Cyril and Methodius"** originally pledged to commit to the project participation of teaching staff in the Expert trainings (USD 10,110) and USD 170,500 for technical equipment to be used in the trainings, but in the end, equipment was not used.

The co-financing commitment by **REC Macedonia** amounted to a total of USD 102,000. It consists of costs for staff (PMU and administrative staff) necessary for project implementation, infrastructure (e.g., office space, meeting room, transportation, webspace, etc.) and access to industry networks and experts in Northern Macedonia. However, no records were kept of the actual contributions. Nevertheless, the planned contributions as defined in the co-finance commitment letter are highly comprehensible and the evaluation team considers the planned contribution to have been made on the basis of the discussions and available documents.

Originally not planned or considered were contributions by EVN North Macedonia. **EVN** contributed USD 10,000 in the form of cash and in-kind. The cash component (the exact amount is not disclosed) was paid to national IEE Experts to carry out EnMS analyses in replicating companies.

Another considerable in-kind contribution was made by the **national IEE experts**, which is estimated by UNIDO to amount to about USD 135,000 in time spent for the analyses in the partner enterprises, reporting and participation in the training measures.

Although numbers are not available, the significant engagement of professor Ana Lazarevska of the **Faculty of Mechanical Engineering of the Sts Cyril and Methodius University** shall be highlighted here, not only for her engagement to introduce two IEE courses in the curriculum of the Faculty but also her important work in supporting the set up and operation of the Association of National IEE consultants.

Table 6 outlines the project co-financing.

Table 6: Project co-financing (overview)

Organization/Group	Amount pledged (USD)	Amount Materialized (USD);	Remarks
UNIDO; grant	60,000	60,995	-
UNIDO; in-kind	390,000	482,612	-
Ministry of Environment and Physical Planning; in-kind	150,000	50,000	Outputs related to MoEPP did not materialize and little involvement in those realized.
Ministry of Economy; cash	0	7,600	Subsidy provided to two companies out of the "Programme for Competitiveness, Innovations and Entrepreneurship" (overall the Programme was endowed with a cumulated amount of USD 320,600 between 2017 and 2021)
Ministry of Economy; in-kind	100,000	100,000	work on EE Law and related regulation, participation in Expert trainings, implementation of EE measures)
Energy Agency; in-kind	100,000	100,000	Website, participation in trainings, EnMP certification programme
Private sector - industry; in-kind	197,260	63,105	6 of 15 companies reported staff hours, in-kind contribution probably higher than reported
Private sector - industry; cash	220,000	~ 2,600,000 as result of EnMS/CASO/SSO Expert training and support plus 71,000 leveraged through PCI	-
MBPD; in-kind	54,758	5,000	MBPD withdrew from project, only initial negotiations considered

Organization/Group	Amount pledged (USD)	Amount Materialized (USD);	Remarks
MBPD; cash	3,800,000	0.00	MBPD withdrew from project
Bilateral Aid-Agency (USAID - Timel); in-kind	550,000	550,000	Measurement equipment provided, user trainings carried out; however: cost not separately reported.
Faculty of Technology and Metallurgy; in-kind	180,610	10,110	USD 170,500 relate to technical equipment to be used in the training; in the end, equipment was not used.
REC Macedonia; in-kind	102,000	102,000	-
EVN Macedonia (cash and in-kind)	Initially not planned	10,000	Coverage of cost for national EnMS experts implementing EnMS in selected companies
Contributions of national IEE Experts (EnMS and ESO)	Initially not planned	~ 135,000	Amount covers time spent for assessments carried out in enterprises, reporting and participation in trainings
Total	**5,904,000**	**~ 4,347,422**	

The rating for project efficiency is "moderately satisfactory"

3.4 Sustainability

Sustainability is understood as the likelihood of continued benefits from the project implementation after the project ends. In this section, the project's exit strategy will be reviewed and assessed if and to what extent the four risk categories Financial Risks, socio-political risks, institutional and governance risks, and environmental risks affect the project's outcomes.

Exit strategy: Knowledge transfer

In terms of sustainability, the project had its greatest strength in the solid anchoring of knowledge and know-how in the country. Through its strongly practice-oriented approach, the project not only transferred theoretical knowledge, but also put people in the position to tackle IEE measures on their own. Even though the topic of energy efficiency may have a different priority in different companies, it became very clear in the discussions held with industry representatives that the project helped to establish new ways of thinking and, in many cases, provided tools for analyzing and implementing IEE

measures that are still in use today. The visit to a company during the field visit made a lasting impression on the evaluation team. The energy management team there was highly motivated and explained to the evaluators in detail the many smaller and larger measures that had been implemented or were in the process of being implemented. What was particularly interesting here was that the company identified these measures with the help of the EnMS tools provided by UNIDO and that these tools have become a central part of the work to plan and monitor their energy efficiency measures. The energy managers cited the high quality of the expert trainings and especially the intensive support of the measures planning by the international expert, but also the consistent support of the measures by the higher management in the company as key success factors.

Of course, this example should not obscure the fact that not all companies implement the results from the project to the same extent. One project manager assessed the situation in such a way that about one third of the partner companies continue to actively address the topic of IEE, for one third the topic has arrived, but certain factors such as a lack of backing from higher management or a lack of resources hinder greater implementation of measures, and one third have returned to business as usual. This assumption is supported by the industry survey carried out by the project in 2022, in which it became evident that a good part of the partner enterprises does not implement EnMS further. From the evaluation team's point of view, this underscores the importance of follow-up initiatives for projects such as this one, which were able to lay a very solid foundation, but the momentum declines the moment a project ends.

In addition to anchoring knowledge in the industry itself, capacity building among national IEE consultants is another important building block for the sustainability of the project. Here, the result can be described as exceptional. During the field visit, the evaluation team met a group of highly motivated national experts, who have now even formally organized themselves into the "Association of Consultants - Joined Energy Efficiency Experts Skopje". The purpose of this association, apart from the professional exchange, is to stimulate and support national and international initiatives in the field of IEE. Thanks to the individuals involved here, it seems very likely that new initiatives can arise from this.

Another indication that the group of national IEE consultants continues to use the newly acquired knowledge is that in the online survey conducted, only four out of twenty survey participants stated that they are currently no longer active in the field of IEE, and the remaining 16 are involved in one or more fields of activity related to IEE. Nevertheless, it should also be noted here that a total of 38 national consultants were asked to participate in the survey, so it is not known from 18 whether they are still applying the project results. Nevertheless, it can be clearly stated that thanks to the project, a highly qualified and motivated group of experts has emerged, who on the one hand apply their acquired knowledge in their work, but on the other hand can also act as a crystallization point for the future development of IEE.

Another important factor for the permanent anchoring of knowledge in the country is that content from the Expert Trainings was used by the Faculty of Mechanical Engineering at the University "Sts Cyril and Methodius" for the design and implementation of a Bachelor's and a Master's course on the subject of IEE. These are elective courses that have been conducted annually since 2020. It is also noteworthy that since then two theses were completed on IEE topics in the meantime.

Exit strategy: Legal framework

Another important aspect for the sustainability of the project results is the fact that key legislation (EE Law) and required regulation (EnMP certification and training) was not only prepared but enacted. Even if the Rulebook on Energy Auditing for Large Enterprises is still in the legislative process but likely to be passed soon (as this is a requirement stipulated in the EE Law), it became evident in all discussions

with company representatives and IEE consultants that this is the very foundation that is likely to shape large enterprises' handling of energy.

Exit strategy: Outcomes that did not or only partly materialize

Other outcomes were also clearly designed for sustainability in the project planning. However, since these were not implemented, were implemented only partially or were implemented late, their lasting effects cannot be expected or reliably estimated. For example, it is to be expected that the study on the Assessment of Climate Technologies will still be produced, but there is a risk that it cannot be promoted due to a lack of resources. The same applies to the TAF/PCI financing mechanism, which is currently being tested but is not expected to be continued with other funds. Here, too, the experience gained could quickly be forgotten if it is not actively taken up by follow-up initiatives. For this reason, too, it would have been desirable for the delay or problems with these outputs to have been resolved earlier, as the results could then still have been communicated.

Communication and dissemination of results

As described several times already, the project has succeeded in enabling industry to implement very interesting practical examples within the framework of the project, which experience has shown to be very helpful in convincing other companies of the benefits of IEE approaches. The project has also taken these up and made them available, for example, via case studies on the IEE BPD website or presented them at events. Nevertheless, the project team also noted that the dissemination of these positive examples should have been carried out more intensively and in a more targeted manner, but that the resources for this were lacking. In discussions with the industry representatives, a national IEE consultant and one of the trainers, the great importance of communicating the IEE benefits to the higher management of the companies was emphasized. Although there were a few events and trainings for the target group of decision makers, a more intensive work with a suitable communication concept for future similar initiatives seems advisable.

External risks that could affect project results

Financial Risks: As shown in section 2.2, companies were able and willing to invest funds in IEE measures even to a greater extent than expected. Since these investments have short payback periods, it is to be expected that companies will be able and willing to raise funds for IEE measures in the future, especially in view of the current rise in energy prices. The financial risk for the sustainability of the project results is therefore rated as very low.

Socio-political risks: The current engagement of the Government to promote Energy Efficiency through the EE Law suggests that there currently only is a rather low political risk that could immediately endanger the results achieved by the project. Since energy efficiency and subsequent economic and other environmental advantages (increased competitiveness, modernization of the industry sector, less air pollutants etc.) are providing numerous benefits at little cost to the society, social opposition is not to be expected. Social-political risks for the sustainability of the project results are thus rated as very low.

Institutional framework and governance risks: Although the current EE Law is likely to give impulses to large companies to do more for energy efficiency, there still is a risk that the actual enforcement of the Law may be difficult. At the moment, it is not yet clear if the Government has sufficient capacities to monitor the implementation of the new requirements and to enforce them in case of non-compliance. This is also why the evaluation team considers the Data Management Framework so important which was foreseen but, in the end, has not been advanced. Due to the fact, that the Energy Agency of the RNM is clearly mandated by the EE Law to monitor compliance with the Law, the institutional framework and governance risk for the sustainability of the project results is rated as

medium.

Environmental risks: The project produces numerous environmental advantages, and no external environmental risk (other than environmental catastrophes) could be identified that would endanger the achieved results. The environmental risk is thus rated as very low.

The rating for sustainability of benefits is "likely".

3.5 Gender Mainstreaming

During the project preparation phase in 2013 the baseline study "Gender mainstreaming of the project Energy Efficiency in Industry" was elaborated for the project by the Centre for Research and Policy Making in Skopje. The report assessed Macedonian legislation and the state of affairs in gender mainstreaming in the industry and made recommendations on how the topic of gender can be integrated in the project. The report was based on an in-depth literature review and interviews with government officials, women managers and entrepreneurs, associations, and other gender-related experts.

Later in the project, the case study report "Women in Energy (Efficiency) Management Systems in industry" was elaborated. For this report, a number of partner enterprises of the project were selected, and their views and activities related to gender equality and women's empowerment analyzed. The report also provided recommendations on how the role of women could be enhanced in the specific context of IEE.

Table 7 compares the key recommendations of the baseline study and the case study report with what has been done and/or achieved in the project.

Table 7: Achievements of the project in the area of gender mainstreaming

Measure/target	Achievement
Robust women representation in the Project Advisory Committee	About 50% (without UNIDO and PMU representatives; 75% if all UNIDO/PMU representatives are included).
Share of women participating in training measures and events minimum 20%, better 30% to 50%	• On average about 20% - the share of women in Expert Trainings tends to be lower than in other trainings/events. • Group of qualified EnMS/ESO Expert: CASO and SSO: 20% in each Expert group; Qualified EnMS Experts: 23%.
Active encouragement and support for female trainees and managers to participate in project activities or engage more on the subject matter in industry (e.g., targeted communication to and approach to women, or through mentorship schemes in industry, respectively)	Besides ensuring the target of 20% share of women's participation, the project offered assistance for child-care during the trainings (this offer was used once, when a room in the hotel where the training took place was booked for a mother and her child). A mentorship scheme in industry or specific approach to address women in particular for training participation was not implemented.
Recognition and awareness raising about female leadership/achievements (e.g., through public communication measures)	• One-day round-table on "Gender in IEE" in December 2019 (with 13 female and 8 male participants)

	• Video on gender mainstreaming for IEBPD website under preparation at the time of the TE
Encourage girls to explore topics and professions that are traditionally the domain of men	Online workshops for two primary and two secondary schools carried out in Q2 2021 presenting the results of the study
Involving and whenever possible collaborating with women networks and enterprises/associations' gender focal points	"Association of Business Women" was permanent member of the PAC.
Awareness raising and capacity building on gender equality and benefits of including women in decision-making and operations management in industry	Implementation of the "Gender in IEE Case Study Report", gender round-table (see above) and video on gender mainstreaming (see above). No other activity identified.
Include gender-related minimum criteria for partner companies for project participation	No related activity identified

As Table 7 shows, the project has taken care of gender mainstreaming by monitoring and ensuring the participation of women in decision-making bodies and the participation of a minimum percentage of women in the trainings. Furthermore, the IEE-specific case study and the related event helped to further deepen the topic and it was brought to the public in the context of the events in secondary schools. From the point of view of the evaluation team, the project was able to take up most of the recommendations of the baseline study and case study report, even if there still was some room for even greater ambition. But it should also be noted that GEF-5 projects only had "to include considerations for gender mainstreaming", the baseline study in this project was the first of its kind in a UNIDO Energy initiative and that no specific funds to support gender work were available. In this light, the evaluation team concludes that the project has dealt very well with the gender aspect, even if not all recommendations were taken up in full and thus rates gender mainstreaming as highly satisfactory. The tram still encourages UNIDO to further increase ambition on this matter in future initiatives due to the inequalities that still exist.

The rating for gender mainstreaming is "highly satisfactory".

4 Performance of Partners

4.1 UNIDO

UNIDO was the GEF Implementing Agency and thus responsible for the implementation of the planned outputs, the monitoring of the entire project and the careful handling of the GEF grants as well as contributions from partners (government and industry). UNIDO also played a special role on the technical level by providing the materials and tools needed for the trainings as well as technical support. Based on the successes achieved, it can be stated that UNIDO has fulfilled its task and responsibility to a high degree and has clearly contributed to the success of the project.

The evaluation team would like to emphasize that UNIDO's technical contributions on the topic of IEE were also described by almost all interview partners as being of particularly high quality and useful for practice. The replication of the practice-oriented training and consulting approach followed by UNIDO has proven to be particularly effective and relevant in Northern Macedonia. The concept itself and the technically sophisticated implementation appear to be decisive in this regard. Especially with regard to the latter, UNIDO's network to international experts from the IEE scene should also be mentioned as an important success factor. The international trainers and consultants enjoy high recognition among the beneficiaries both from the group of national IEE experts and partner companies.

Interviewees in particular highlighted the strong commitment and high responsiveness of both UNIDO as backstopper and the international experts.

However, in the area of risk management and managing the long delays in the implementation of certain outputs of Component 1 and Component 3 would stronger supervision and leadership have been desirable.

The rating for UNIDO's performance is "satisfactory"

4.2 National Counterparts

The contribution of the Government Executing Partners has been covered in the discussion of their co-financing in section 3.3 of this report. It can be summarized that the Ministry of Economy showed a strong ownership in the project playing an active role in the definition of the newly adopted EE Law and related regulation. Similar is the commitment of the Energy Agency which has contributed as planned to the implementation of the IEE BPID website and assumed its role as the Government entity being responsible for enforcing and monitoring the energy auditing of large enterprises and implementation of the EnMP certification required by the EE Law. Unfortunately, MoEPP's engagement was limited primarily to its role as chair of the PAC; strong engagement with respect to the implementation of the Climate Technology Assessment or the Industrial Data Management Framework was not noted. It is suggested that UNIDO and the MoEPP agree on mutual expectations and work towards stronger cooperation, also with a view to possible follow-up initiatives. Another important national counterpart would have been the MBPD, but it had to withdraw its initial commitment because of the COVID-19 pandemic. The performance of the national Government counterparts is rates as moderately satisfactory, considering the COVID-19 pandemic as force majeure.

REC assumed the role as Project Management Unit (PMU). As such, it was an indispensable partner on site for the coordination of all stakeholders and the implementation of all activities. As the results of the project show, REC successfully fulfilled this task, even though the delays already described occurred. The interviewees regularly described REC as highly responsive and highly recognized their performance in the day-to-day project implementation. REC also played a particularly important role in facilitating existing and establishing new contacts in industry and with national experts. Here, REC succeeded in attracting companies to the project on a larger scale than planned through skillful networking. Overall, REC's performance as PMU is rated as "satisfactory".

The overall rating for the National Counterparts' performance is "satisfactory"

4.3 Donor

The GEF Operational Focal Point (in MoEPP) endorsed the Project Identification Form, triggering a GEF grant of USD 1,40,000. UNIDO reported that there was a timely disbursement of project funds and described coordination and communication positively. The annual PIRs prepared for the GEF were accepted.

The rating for the donor is "highly satisfactory"

The overall rating for the performance of partners is "satisfactory"

5 Factors facilitating or limiting the achievement of results

5.1 Monitoring and evaluation implementation

This section describes how the project's M&E plan to track project implementation was carried out (for the discussion of the M&E design, please refer to section 3.1.2. M&E activities and their level of implementation are shown in Table 8.

Table 8: M&E activities of the project and their level of implementation

Planned M&E element	Level of implementation
Project Inception Workshop	The Kick-off workshop was held on 28 May 2015 in Skopje. The workshop aimed at i) introducing the stakeholder to the project approach, deliverables and milestones of the project and collecting stakeholder feedback, and ii) establish the Project Advisory Committee (PAC). A separate inception workshop that would cover (as planned in the project document) detailed work planning, discussion of indicators, assumptions and risks as well as detailed discussion of reporting and M&E work plan was not held. However, the then Excel-based implementation report of the first year 2016 contain tables for performance rating (incl. key performance indicators and justification), risk management, implementation and execution issues, grant disbursement, work plan and budget, stakeholder feedback, environmental and social safeguards, and knowledge management show that the project team has set up and used the required reporting and M&E tools. The Excel-based project reporting table was the basis for the annual project review (see below) used later in the project.
Review of Key Performance Indicators (KPI)	KPI were defined in the project document. The review of the KPI was carried out annually in each project year in the Excel-based progress reporting table which included a separate table for tracking the progress of the KPI. KPI tracking was well-comprehensible and provided a good overview of the progress made (or possible delays or encountered problems) from year to year. Problems that have been encountered were to a good extent explained in the Risk Management table of the same Excel report.
Annual Project Review (APR)	The APR was carried out through the Excel-based annual project reporting table already mentioned above and separate project implementation reports (PIR) and have been carried out throughout the project until FY 2020/2021. These PIRs were submitted every year in the form of Excel tables until 2017, then as Word Documents of which the structure also changed over time. The change of formats (except for the stringent project reporting table) and structure of the PIR were sometimes confusing for the external reader, and it seemed that the same information has been reported several times in different documents. Further streamlining of this reporting work may be advisable. Once first results were achieved, the PIRs were supported with relevant Annexes. Despite the described minor problems, the reports were useful to get a realistic picture of the project status.

Planned M&E element	Level of implementation
Independent mid-term review	A mid-term evaluation was budgeted but not carried out. Although a mid-term review is not mandatory for medium-sized GEF projects, it would have been advisable to carry out such a review especially since the project was delayed in the implementation of some of the outputs under Component 1 and all outputs under Component 3. It might also have been an opportunity to give some advice on ongoing collection of data from industry but also in the context of other activities (for instance trainings).
Final evaluation	In progress.
Learning and Knowledge Sharing	Learning and knowledge sharing is one of the very fundaments of this project. Thus, since training and dissemination activities have been carried out successfully in the project and content of the project's trainings is still being taught at the Faculty of Mechanical Engineering at the University "Sts. Cyril and Methodius", the objective of sharing learnings and knowledge is to be considered as achieved to a highly satisfactory degree. Still, as discussed in the sustainability section 3.4 more intense communication of the benefits of IEE especially to decision-makers in the industry may have added value to the project and should be considered in potential follow-up initiatives. Last but not least, it shall be highlighted here that this project in North Macedonia itself is one of several similar UNIDO-led projects in various countries all around the globe. The project through UNIDO itself thus benefitted from experience made in other projects but lessons learned in North Macedonia are likely to support other projects with similar objectives.

As shown in Table 8 the practical implementation of the M&E system was generally suitable to convey the state of affairs in the project. All reports clearly refer to the indicators of the results framework, furthermore presentations on project progress especially for the PAC picked up this data and discussions in the PAC meetings were held along the project's indicators and targets.

It is in the nature of an ISO 50001 energy management system that potential savings are systematically recorded and communicated. The project took advantage of this for its own results monitoring and required the participating companies to submit final reports after the Expert trainings and implementation support. The evaluation team had final reports from 15 of a total of 21 participating companies that had implemented EnMS. Furthermore, in the summer of 2022, REC conducted another survey among the partner companies to collect data from the period after the final reports on EnMS had been submitted (until 2021). 16 companies have participated in this final survey.

This data collection has made it possible to obtain a good picture of the EE measures that the project has triggered. However, numerical analysis of the data sets proved difficult in this evaluation, and the results are subject to some uncertainty. Reasons for this are inconsistent representations in the data collection forms or reports, but also some ambiguous definitions of what exactly should be reported (e.g., savings compared to the determined energy consumption baseline or the estimated savings of the individual measures?). The large time gap between the final survey and the activities carried out also contributed to increasing data uncertainty. For instance, there is one survey where the respondent – probably another colleague than the one who was participating in the programme - stated that the

company was not a partner company of the project at all although documentation clearly shows that it had implemented measures as result of the project.

But as already mentioned, the data collected by the projects was still valuable. Nevertheless, the project team recommends that data collection and evaluation be more standardized and further developed (e.g., by introducing definitions that are as clear as possible). Although this may seem costly, the evaluation team sees an added value not only for project evaluations, but also and especially for the monitoring of corresponding data at the national level. A UNIDO system based on the experience of this (and the other IEE projects) as well as approaches used in existing national reporting systems could possibly serve as a model for national energy reporting systems.

Budgeting of M&E Activities

A budget of USD 64,000 (of which USD 10,000 were in-kind contributions) was planned and allocated for APR (USD 6,000), a mid-term review (USD 14,000, of which USD 2,000 were in-kind), the final project evaluation (USD 39,000, of which USD 7,000 in-kind) and the terminal project report (USD 5,000, of which USD 1,000 in-kind).

Since overall M&E implementation (that is the regular reporting on project progress through APR and PIR) was carried out using the defined indicators, it can be assumed that resources for M&E have been sufficient to track progress. As mentioned in various places, investing in a mid-term review might have been helpful to analyze the reasons for the looming delays and work with the project to come up with ideas to get the project back on track at these points. Tracking impact indicators (energy savings, GHG emission reductions etc.) was done with some effort and produced valuable data. However, it is also clear that the standard M&E budget cannot be sufficient to fully meet this task. Thus, resources were insufficient to verify the data collected, to check their plausibility and to systematically evaluate them. As mentioned above, a unified system at UNIDO level could possibly help the process of collecting and evaluating impact data systematically.

The rating for M&E implementation is "moderately satisfactory".

5.2 Results-based Management

The broadly successful implementation of the key outputs and outcomes demonstrates that the project worked very results-oriented and had risks under control. This is particularly true for the policy-oriented work related to the EE Law and the implementation of the IEE BPID Platform under Component 1, the cooperation with and support of the companies in Component 2.

However, as already shown in the analysis of the time efficiency of the project (see section x), the work on the Industrial Data Management Framework, the Assessment of Climate Technologies (Component 1) as well as the anchoring of TAF/PCI at the MPBD experienced significant delays or did not meet a few of its targets. In this context, the evaluation team noted that although the delays were identified, they were not further addressed in the risk assessment of the different reporting formats. It was noted that the various risk analyses in the reports mainly presented what had been achieved by the project, that is its results. But the risks that were emerging or had already materialized were at most hinted at, and in most cases not mentioned at all. As a result, there were no suggestions for risk mitigation. It was also noticed that the institutional and co-financing risks were assessed as medium or low. While this may have been correct for most of the work, it was not true for all risks. In the view of the evaluation team, a more differentiated and more in-depth analysis could have helped to identify risks earlier and also to address them more proactively to avoid the experienced delays. Still, the project managed in the end to find a solution for most of the affected outputs (for instance, the TAF/PCI mechanism although not implemented with the MPBD could still be set up or the Climate Technology

Assessment is being carried out) and thus showed its ability to adapt and its ambition to achieve its goals.

The rating for Results-Based Management is "satisfactory".

6 Overarching assessment and rating table

Table 9: Overarching rating table

Criterion	Rating
Effectiveness	S
Progress towards Impact	HS
Design	S
Relevance	HS
Efficiency	MS
Sustainability	S
Gender mainstreaming	HS
Performance of partners	S
Monitoring and Evaluation implementation	MS
Results-based Management	S
Overall rating	**S**

7 Conclusions, Lessons Learned, Recommendations

7.1 Conclusions

C1. Progress towards impact

The project has successfully promoted industrial energy efficiency (IEE) in North Macedonia. It has created a legal framework that sets clear incentives for greater energy efficiency in industry, has been highly successful in enabling experts to implement appropriate projects, and has been able to use good practice examples to communicate the benefits of industrial energy efficiency convincingly and credibly to various stakeholders from politics, industry, and in part also the banking sector. The IEE project has thus contributed directly and indirectly to saving energy and greenhouse gas emissions, but also to increasing competitiveness through energy cost savings. The project has succeeded in introducing the concept of EnMS in line with ISO 50001 in the country on a sustainable basis: While

there was only one ISO 50001 certified company at the start of the project, five additional companies are now certified, and three companies are in the process of preparing for certification. The greatest strength of the project lay in the highly practice-oriented training courses on Energy Management Systems and Energy System Optimization and the support integrated here for industry in implementing appropriate measures. Achievements in the policy component were also satisfactory, as the project succeeded in supporting the implementation of the Law on Energy Efficiency and related regulation for the certification of Energy Management Practitioners as well as in establishing a grant-based financial incentive for ISO 50001 certification in the MoE "Programme for Competitiveness, Innovations and Entrepreneurship". However, the project did not succeed in this component in advancing major progress in national reporting of energy data from industry. In the financial component, the project was able to introduce financial incentives in the form of a Technical Assistance Facility and Performance-based Cash Incentives on a pilot basis.

At the impact level, the target of direct greenhouse gas savings of 67 $ktCO_{2equ}$ was exceeded by a factor of five to six, taking into account that one company alone was responsible for approximately 75% of the direct savings totaling 377 $ktCO_{2equ}$. The partner companies reported that they saved at least USD 17.7 million in energy costs (the company with the largest savings accounted for USD 6 million of this). Since the project showcased that considerable amounts of GHG emissions could be saved without any relevant legislation in place and specific preferential loans available, the evaluation concludes that the indirect emission reduction target of 66 $ktCO_{2equ}$ are likely to be achieved as an effect of the new EE legislation introduced in the country.

C2. Project Design

The **overall design** of the project was satisfactory, as it was able to make an important contribution in particular with its policy component and the component for substantially building up knowledge and know-how on industrial energy efficiency. The financial component was less important, as the project mainly aimed to raise the potentials of industrial energy efficiency at no-cost or low-cost level. The degree of integration of all project measures and thus the internal consistency is very high. The planned measures and targets were ambitious against the background of the given resources. At the same time, the outcomes were planned very pragmatically by picking up existing national initiatives wherever possible so that they had a good chance of being implemented. The **logframe** design was moderately satisfactory because Outputs and Outcomes were partly not carefully delineated and indicators were only partly SMART. Still, despite these problems, with the description of the project approach in the project document, it was possible to derive a relatively clear picture of the project's intentions and impact model. The **monitoring and evaluation** (M&E) and the **risk management** plan were rather short and lacked detail.

Overall, the project design is rated as "satisfactory".

C3. Relevance

At the policy level, the project addresses key existing government strategies and plans in the area of energy efficiency and fills the void that existed until then in terms of IEE. The project also came at the right time for industry. At the time, energy management systems were still very rare in northern Macedonian companies and know-how was hardly widespread, and the potential for untapped no-cost or low-cost measures was correspondingly high. The project was also fully relevant to UNIDO's long-term strategy of Inclusive and Sustainable Industrial Development and fully supported GEF-5 strategic objectives on climate change.

The project's relevance is rated as "highly satisfactory".

C4. Effectiveness

At the policy level, the project was successful in assisting the Government in preparing the EE Law and associated regulation for the certification of Energy Management Practitioners. Both components were enacted by the Government and verified and approved by the relevant Government agencies, respectively. Furthermore, the IEE Best Practice Dissemination Platform was permanently launched as a sub-domain of the website of the Energy Agency. The planned assessment for the identification and prioritization of suitable climate technologies in the industry is still to be finalized. The development of an industrial energy data management framework could not be realized. The results in the industrial component are particularly strong, where significantly more companies than planned were supported in the introduction of energy management systems and the analysis of ESO measures, and the realization rate of concrete energy-saving measures was significantly higher than expected. In this component, significantly more personnel from industry and national IEE consultants benefited from the training measures. Training participants attested these trainings to be of high to very high quality. The results in the component on financing are below expectations. Although two planned training courses were held and a financial facility for the initiation of investments was set up on a pilot basis, although much later than planned, the establishment of a substantial national loan facility was not possible.

The project's overall effectiveness is rated as "satisfactory".

C5. Efficiency

Efficiency was rated with respect to the extent to which the project has produced results within the expected timeframe and budget as well as its ability to materialize co-financing. The project used its budgeted resources efficiently but suffered from significant delays which can be partly be traced back to external events (Government crisis in 2016 and 2017 and COVID 19 pandemic) but are also the result of somewhat delayed intervention by the project to resolve the reasons of the delays. The planned co-financing was realized at slightly more than two-thirds of the planned amount of USD 5.9 million. The reduction is mainly due to the withdrawal of MBPD (USD 3.8 million cash), but could be partly compensated by the significantly higher contribution of the industry (USD 2.6 million instead of USD 0.22 million).

The efficiency of the project is rated as "moderately satisfactory".

C6. Sustainability of Benefits

The exit strategy of the project was successful because the project succeeded in substantially anchoring IEE knowledge in the country and, with the adoption of the EE Law, in creating an important incentive for future industrial energy savings. Another positive aspect of the knowledge transfer is that the national IEE consultants trained by the project have formed an association as a result of the project and the contents of the training courses have been transferred to two new university courses. However, the sustainability of the project is somewhat limited because the many interesting results could have been communicated to other relevant stakeholders more intensely. Financial, socio-political and environmental risks are very unlikely to jeopardize project results, only the missing resources in the Government Agencies to enforce the EE Law and related regulation could pose a threat to actual implementation of measures but this risk is still considered as moderate.

The rating for sustainability of benefits is "likely".

C7. Gender Mainstreaming

The project has taken care of gender mainstreaming by monitoring and ensuring the participation of women in decision-making bodies and the participation of a minimum percentage of women in the trainings. Furthermore, the IEE-specific gender case study and the related event helped to further deepen the topic and it was brought to the public in the context of the events in secondary schools. The project has achieved what was possible with the available resources, but at the same time it shall be noted that not all recommendations of the gender study carried out during project reparation have been taken up in full. In possible future initiatives, the topic should be pursued in any case and with increased ambition due to the inequalities that still exist.

The rating for gender mainstreaming is “highly satisfactory”.

C8. Monitoring and Evaluation (M&E)

The M&E process and specific reporting requirements were sufficient to track targets on the output and outcome level. To track targets in the impact level, the projects has undertaken efforts to collect data from industry. However, numerical analysis of this data proved difficult in this evaluation due to some inconsistencies in the data sets themselves and a missing clear methodology for data analysis. An originally planned mid-term review was not carried out but might have helped to resolve some of the difficulties encountered with the implementation of some outputs.

The rating for M&E implementation is “moderately satisfactory”.

C9. Results-Based Management

The broadly successful implementation of the key outputs and outcomes demonstrates that the project worked results-oriented and had most risks under control. Still, some outputs could not be realized or were significantly delayed. A more differentiated risk analysis and stricter risk management might have helped to resolve the encountered issues. However, the project in most cases showed its ability to adapt to the problems and ensured that almost all outputs were implemented in the end.

The rating for Results-Based Management is “satisfactory”.

C10. Performance of Partners

The very good performance of **UNIDO** and its contributions in particular on the technical level if IEE were highly acknowledged by project beneficiaries and project partners. The UNIDO developed practice-oriented training and support approach proved to be very effective and contributed strongly to observable behavioural change. A stronger supervision and leadership by UNIDO regarding the problems encountered with the implementation of some Outputs might have been advisable, though. The **Ministry of Economy and the Energy Agency** displayed a strong commitment to the project and ensured that important Outputs and Outcomes could be attained. Unfortunately, the engagement of the **Ministry of Environment and Physical Planning** was primarily limited to its role as chair of the PAC; strong engagement with respect to the implementation of the Climate Technology Assessment or the Industrial Data Management Framework was not observed. **REC North Macedonia** fulfilled its role as Project Management Unit successfully. Interviewees acknowledged the high quality of REC’s work and it was noted by the evaluation team that REC was indispensable for facilitating communication with the industry partners and the acquisition of new partners.

7.2 Lessons Learned

The failure of the MBPD has shown that cooperation with government-owned institutions is always fraught with risk. The processes leading to the final decision to implement joint measures can be severely delayed, and also depend on the will of the partner. Uncontrollable factors, such as the Government crisis of 2016 in the case of Northern Macedonia, can then add significant further uncertainties to the implementation process and eventually make it impossible if other risks of force majeure (like the COVID 19 pandemic) hit.

7.3 Recommendations

Based on the TE's conclusions and lessons learned, some recommendations are offered with the aim of sustaining the project's results and reaching impact:

Recommendation 1: Although the project has been able to generate strong impetus in industry for greater energy efficiency, it is clear that so far it has only been possible to lay a first foundation stone. The return to business as usual of some partner companies and the fact that by far not all producing companies in North Macedonia could be reached shows that further efforts are necessary. It is therefore recommended to launch a follow-up initiative as soon as possible, especially in view of the ongoing energy crisis. Such an initiative should also include a stronger consideration of the financing aspect, so that more cost-intensive measures, which are also necessary for the decarbonization of the industry, can be implemented. In this context, it is also recommended to possibly adopt a programmatic approach that broadens the focus and aims at decarbonizing industry not only through energy efficiency measures, but also other measures such as fuel switch or the use of renewable energies in the industrial context.

Recommendation 2: Future projects should ensure that all outcomes receive similar attention. In this project, it was noticeable that the activities around Outcome 2 in particular were pursued with the greatest vigor; accordingly, the greatest progress was also achieved here. Important progress was also made under Outcome 1, although certain compromises had to be accepted here in the achievement of objectives. Outcome 3, although not as important for the success of the project as the other two outcomes, was hardly able to achieve concrete results during the project period. Although this may have been due to the lack of commitment on the part of the MBPD, it is also noticeable that this Component was not pushed with the possible vigor. When designing future initiative, special attention should thus be given to balance out the different components more strongly, for instance by including more external expertise on topics where UNIDO itself might not have its focus.

Recommendation 3: Carry out a more careful and differentiated risk analysis and include higher-level risks especially in the context of institutional/political risks.

Recommendation 4: As is well known, the project in northern Macedonia is only one of many projects in which similar approaches have been applied. UNIDO can justifiably claim that it has set standards in this area and successfully tested promising approaches. In doing so, UNIDO has built up its own expertise and bundles cutting-edge knowledge and know-how from all over the world. In order to move to the next level, it could be useful to establish an international knowledge hub that could help to centralize good practices for different target groups (possibly in different languages), to present knowledge and know-how, to offer networking opportunities, etc.

Recommendation 5: An interesting additional originally unintended result of the project is the introduction of UNIDO training content into the curriculum of higher education. The evaluation team considers this as an important building block for the transformation of a society towards a climate-friendly economy. UNIDO and its partners could consider to make this a standard component in each

similar project to further enhance sustainability of results.

Recommendation 6: The project had a particular strength in knowledge transfer, especially for technical staff. In many discussions with the industry but also with the national IEE experts, the special importance was also emphasized at the level of the higher management of companies. The project was aware of this, and accordingly offers were made for training at this level and some dissemination events. However, the chosen approach was still quite technical. In possible future initiatives, it should be considered that this target group is addressed in a more targeted manner and also through other suitable channels.

Recommendation 7: The collection of data from industry on the benefits of IEE was pursued by the project with some commitment, but the data could not be analyzed easily on a regular basis and the results are subject to some considerable uncertainties. It is recommended to systematically analyze the experiences related to the collection of these data also from other countries and to methodically improve and streamline the monitoring in this field. This would not only increase the accountability of the projects, but could also provide interesting impulses for the implementation of national energy monitoring systems and national climate reporting.

7.4 Good Practices

- The projects highly practice-oriented approach of the IEE Expert trainings can definitely be considered as a good practice model for sustainably anchoring knowledge and know-how in a country.
- The IEE BPID website is quite well designed and structured. Even though it has a few minor flaws, it could serve as a good example for other initiatives.
- The level of integration of all measures and thus the internal consistency of the project design is very high. The interlocking of the three project components was very well thought out and is exemplary.

Annex i. Evaluation Terms of Reference

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE

Independent terminal evaluation of project

Catalyzing market transformation for industrial energy efficiency and accelerate investments in best available practices and technologies in the Former Yugoslav Republic of Macedonia

UNIDO ID:

GEF Project ID: 4902

January 2022

Table of contents

I. PROJECT BACKGROUND AND CONTEXT

1. Project factsheet[1011]

Project title	Catalyzing market transformation for industrial energy efficiency and accelerate investments in best available practices and technologies in the Former Yugoslav Republic of Macedonia
UNIDO ID	120127
GEF Project ID	4902
Region	Europe and Central Asia (ECA)
Country(ies)	Republic of North Macedonia
Project donor(s)	Global Environment Facility
Project implementation start date	3 October 2015
Expected duration at project design	36 months
Expected implementation end date	30 June 2022
GEF Focal Areas and Operational Project	Climate Change Mitigation - CCM
Implementing agency(ies)	UNIDO
Executing Partners	Regional Environmental Centre (REC) Country Office Macedonia (COM); Ministry of Economy, Energy Agency of North Macedonia, Ministry of Environment and Physical Planning
Donor funding	USD $ 1,400,000
Project GEF CEO endorsement / approval date	1 May 2015
UNIDO input (USD)	390,000 (in-kind) 60,000 (cash)
Co-financing at CEO Endorsement, as applicable	USD $5,094,628
T (USD), excluding support costs and PPG	USD $ 7,3094,628
Planned terminal evaluation date	1 April - 15 June 2022

(Source: Project document)

[10] Data to be validated by the Consultant

2. Project context

The industrial sector is Macedonia's largest energy consumer, and mostly relies on electricity and petroleum products. In 2014, industry accounted for 30% of final energy use, while generating around 28% of national GDP and engaging over 30% of total labour force. Industry is also the sector with the largest estimated potential for energy savings: 91.1 ktoe cumulated over the period 2010- 2020, equal to 38% of the total industry consumption. Despite of the noticeable progress made in this field by the Macedonian Government and industrial sector in recent years, substantial technical and economic potential for energy efficiency gains remains untapped.

3. Project objective and expected outcomes

The project objective was/is to reduce greenhouse gas emissions of industry in the Republic of Macedonia to by accelerating the transformation of the local market for industrial energy efficiency (IEE) towards increased use, demand and provision of IEE best-available practices and technologies and related consultancy and investment related services.

The Project has pursued such objective by addressing many of the existing barriers to industrial energy efficiency in North Macedonia. Work has been structured around three components.

Component 1 - Strengthening Macedonian policy, regulatory and institutional frameworks for IEE and green industry

This component is designed to ensure that supportive policies, secondary legislation and programs specifically targeted to promote and support industrial energy efficiency and energy management systems are put in place. It also aims to ensure that decision-makers build the knowledge needed to promote and support industrial energy efficiency in a sustainable and increasingly more effective way.

Component 2 - Market development support for deployment and diffusion of best available practices and technologies for energy efficiency and environmental sustainability in industry

This component is designed to introduce and support deployment of energy management systems in line with ISO 50001 and best-available techniques for industrial energy systems efficiency improvement in Macedonian enterprises and local IEE market. The goal will be pursued by working both on the demand and supply side for energy efficiency services, through knowledge dissemination between industry decision-makers, skills and expertise upgrade of national EE service providers, training enterprises through hands-on experience and coaching in implementing energy management systems and energy systems optimization projects. This component makes use of a "Train-the-Trainers" approach.

Component 3 - Scaling-up of investments in energy efficiency technologies for industry

This component aims at accelerating the pace of investments in IEE projects and technologies. The project will intervene to enhance the use of existing financing facilities for investments in industrial EE as well as to help mobilize additional financing from the Macedonian banking sector. The project will specifically focus on increasing the quality and number of IEE projects and investment proposals submitted to Macedonian banks; Increasing the incentives for enterprises and banks to invest and engage in industrial energy efficiency projects.

With regard to the project outcomes, please see below a summary view.

GEF CCM Outcome 2.1: Appropriate policy, legal and regulatory frameworks adopted and enforced

Project Outcome 1 - Enhanced promotion and support of sustainable industrial energy efficiency by strengthened policy and regulatory frameworks and market-based mechanisms

Project Outcome 2 - Adoption of energy and environment management systems leading to greater resource investments in energy efficiency measures and low carbon technologies, and increased energy productivity and competitiveness of Macedonian industries

GEF CCM Outcome 2.2: Sustainable financing and delivery mechanisms established and operational

Project Outcome 3 - Adoption of energy efficient and low carbon process/ sector specific technologies

4. Project implementation arrangements

UNIDO has been responsible for the overall management and monitoring of the project, and reporting on the project performance to the GEF. UNIDO has been responsible for procuring most of the international expertise needed to deliver planned project outputs and for supervising work of the international teams and ensure that deliverables were technically sound and consistent with the requirements of the project. UNIDO has also provided substantial direct expert inputs to many project activities under all project components. UNIDO has provided planning, management, technical and monitoring support to the project management unit.

A project management unit (PMU) was established within the Regional Environmental Centre for Central and Eastern Europe – Country Office Macedonia (REC Macedonia), main project executing partner. The PMU has been responsible for the day-to-day management, monitoring and evaluation of project activities on the ground. The PMU has been responsible for the overall coordination of project activities carried out by international and national experts, and by project partners and counterparts. The PMU and REC Macedonia has been also in charge of the direct organization of various seminars and trainings, and execution of other activities.

A Project Advisory Committee (PAC) was established for periodically reviewing project implementation progress, facilitate co-ordination between project partners, provide transparency and guidance, and ensuring ownership, support and sustainability of the project results. The PAC consists of representatives of key partner ministries, public institutions, private sector, NGOs, and other international organizations partnering in the project or having relevant ongoing programs.

The Ministry of Environment and Physical Planning (MEPP) with the GEF Political and Operational Focal Points is the ministry responsible for the overall national project intendance and the coordination of Government institutions' work. The Ministry of Economy and the Energy Agency of the Republic of North Macedonia have been leading and/or overseeing most of the substantive work performed under Project Component 1.

Fig.1 below shows a diagram of the project implementation arrangements.

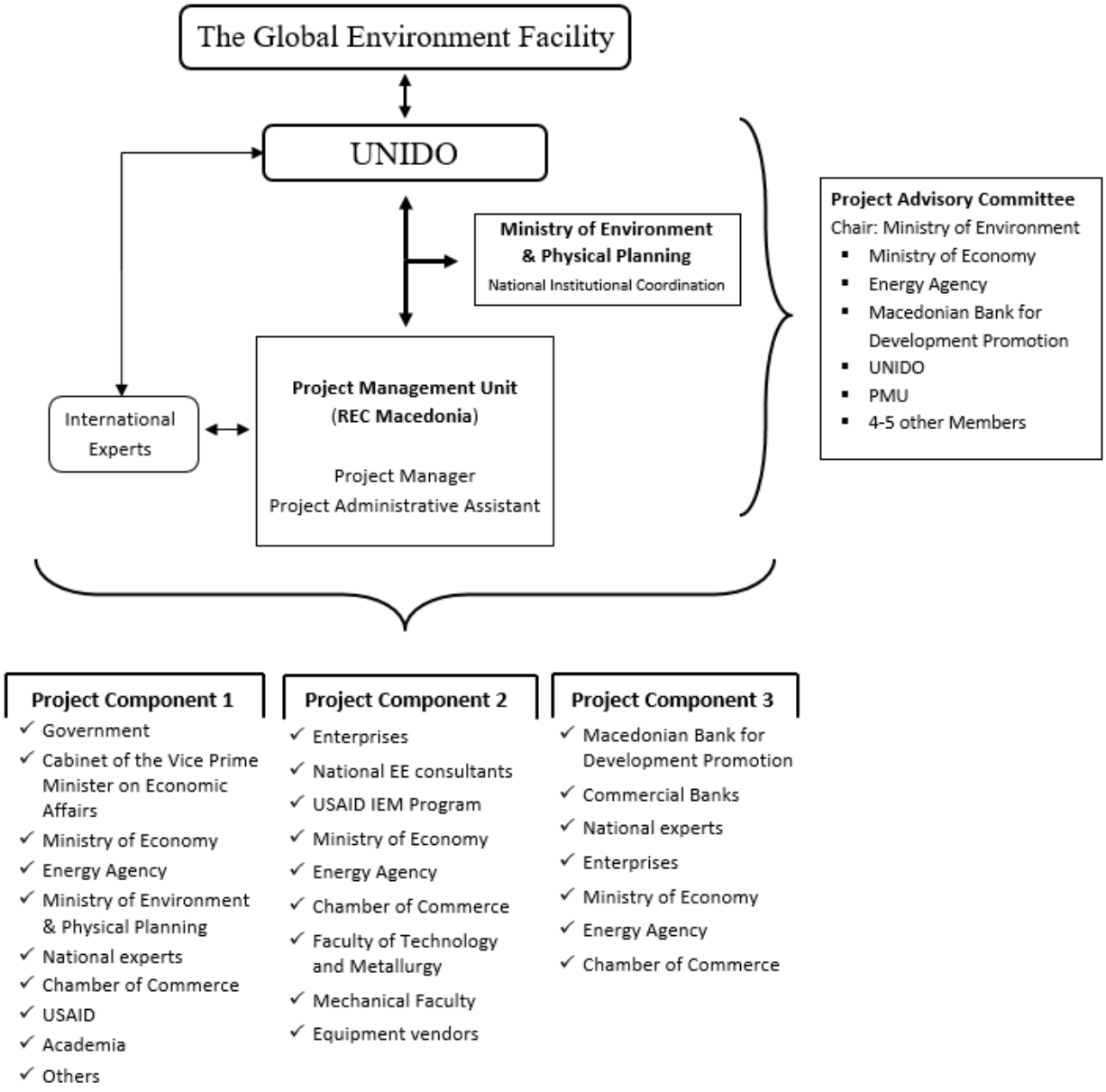


Fig. 1 Schematic of project implementation structure

5. Budget information

Table 1. Financing plan summary

$	*Project Preparation*	*Project*	*Total ($)*
Financing (GEF / others)	50,000	1,400,000	51,4
Co-financing (Cash and In-kind)	50,000	5,904,628	56,532
Total ($)	**100**	**7,932**	**107,932**

Source: CEO endorsement document

Table 2. Financing plan summary – Outcome breakdown[12]

Project outcomes	Donor (GEF/other) ($)		Co-Financing ($)	Total ($)
1. Enhanced promotion and support of sustainable industrial energy efficiency by strengthened policy and regulatory frameworks and market-based mechanisms (Project Component 1)	TA	231,000	410,000	**641,000**
2. Adoption of energy and environment management systems leading to greater resource investments in energy efficiency measures and low carbon technologies, and increased energy productivity and competitiveness of Macedonian industries (Project Component 2)	TA	620,000	1,300,000	**1,920,000**
3. Adoption of energy efficient and low carbon process/ sector specific technologies (Project Component 3)	TA	120,000	134,628	**254,628**
	INV	300,000	3,800,000	**4,100,000**
4. Monitoring and evaluation	TA	24,000	40,000	**64,000**
Project Management cost		105,000	220,000	**325,000**
Total ($)		**1,400,000**	**5,904,628**	**7,932**

Source: CEO endorsement document

Table 3. Co-Financing source breakdown

Name of Co-financier (source)	In-kind	Cash	Total Amount ($)
Ministry of Environment and Physical Planning *(National Government)*	150,000	-	**150**
Ministry of Economy *(National Government)*	100,000	-	**1000**

[12] Source: Project document.

Energy Agency *(National Government)*	100,000	-	**100,000**
Industrial Enterprises *(Private sector)*	197,260	220,000	**417,260**
Macedonian Bank for Development Promotion	54,758	3,800,000	**3,854,758**
USAID - TimelProekt *(Bilateral Aid-Agency)*	550,000	-	**550,000**
Faculty of Technology *(Others -Academia)*	180,610	-	**180,610**
REC Macedonia *(Others - NGO)*	102,000	-	**102,000**
UNIDO *(GEF Agency)*	390,000	60,000	**450**
Total Co-financing ($)	**1,824,628**	**4,080,000**	**6,532**

Source: CEO endorsement document

Table 4. UNIDO budget execution (Grant 2000003016) - USD

Items of expenditure	2015	2016	2017	2018	2019	2020	2021	2022	Total Expend. ($)	% of total Expend.
11 - International Consultants	57,987.33	100,809.95	46,410.55	54,318.93	6,648.46	2,412.65	3,170.99		**271,758.86**	***20.39%***
15 - Local travel	1,670.43	5,151.16	2,817.40	0	3,292.12	**0**	**0**		**12,931.11**	***0.97%***
17 - National Consultants	0	4,335.22	1,962.06	9,850.92	9,948.63	205.58	7,240.29		**33,542.70**	***2.52%***
21 - Nat. Contractual Services	520,000.00	15,157.73	0	67,947.26	7,880.70	47.70	307,013.25		**918,046.64**	***68.88%***
21 - Int. Contractual Services	0	0	5,293.98	0	0	2,000.00	35,028.36		**42,322.34**	***3.18%***
35 – International Meeting		3,472,10	726.02		740.89				**4,939.01**	***0.37%***
45 - Equipment	9,035.00		35,528.23			487.68	253.30		**45,304.21**	***3.40%***
51 - Other Direct Costs	1,164.28	(22.62)	208.47	45.06	789.40	185.26	1,595.56		**3,965.41**	***0.30%***
Grand Total	**589,857.04**	**128,903.54**	**92,946.71**	**132,162.17**	**29,300.20**	**5,338.87**	**354,301.75**		**1,332,810.28**	***100.00%***

Source: UNIDO Project Management database as of 11 January 2022

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 to the estimated completion date in 30/6/2022.

The evaluation has two specific objectives:

(i) Assess the project performance in terms of relevance, effectiveness, efficiency, sustainability and progress to impact; and

(ii) Develop a series of 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[13] and the UNIDO Guidelines for the Technical Cooperation Project and Project Cycle[14]. I

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 liaise with the UNIDO Independent Evaluation Division (ODG/EIO/IED) on the conduct of the evaluation and methodological issues.

The evaluation will use a theory of change approach and mixed methods to collect data and information from a range of sources and informants. It will pay attention to triangulating the data and information collected before forming its assessment. This is essential to ensure an evidence-based and credible evaluation, with robust analytical underpinning.

The theory of change will identify 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 the 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)
- 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.

[13] UNIDO. (2015). Director General's Bulletin: Evaluation Policy (UNIDO/DGB/(M).98/Rev.1)
[14] 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)

(c) **Field visit** to project sites in North Macedonia.

2. Evaluation key questions and criteria

The key evaluation questions are the following:

(a) What are the key drivers and barriers to achieve the 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?

(b) How well has the project performed? Has the project done the right things? Has the project done things right, with good value for money?

(c) What have been the project's key results (outputs, outcome and impact)? To what extent have the expected results been achieved or are likely to be achieved? To what extent the achieved results will sustain after the completion of the project?

(d) What lessons can be drawn from the successful and unsuccessful practices in designing, implementing and managing the project?

The evaluation will assess the likelihood of sustainability of the project results after the project completion. The assessment will 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 5Table below provides the key evaluation criteria to be assessed by the evaluation. The details questions to assess each evaluation criterion are in Annex 2.

Table 5. Project evaluation criteria

#	Evaluation criteria	Mandatory rating
A	**Impact**	**Yes**
B	**Project design**	**Yes**
1	• Overall design	Yes
2	• Logframe	Yes
C	**Project performance**	**Yes**
1	• Relevance	Yes
2	• Effectiveness	Yes
3	• Efficiency	Yes
4	• Sustainability of benefits	Yes
D	**Cross-cutting performance criteria**	
1	• Gender mainstreaming	Yes
2	• M&E: ✓ M&E design ✓ M&E implementation	Yes
3	• Results-based Management (RBM)	Yes
E	**Performance of partners**	
1	• UNIDO	Yes

#	Evaluation criteria	Mandatory rating
2	• National counterparts	Yes
3	• Donor	Yes
F	**Overall assessment**	Yes

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, e.g. 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, e.g. the 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***:

a. **Need for follow-up**: e.g. in instances financial mismanagement, unintended negative impacts or risks.
b. **Materialization of co-financing**: e.g. the extent to which the expected co-financing materialized, 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.
c. **Environmental and Social Safeguards**[15]: appropriate environmental and social safeguards were addressed in the project's design and implementation, e.g. 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 6.

Table 6. Project rating criteria

Score		Definition*	Category
6	Highly satisfactory	Level of achievement presents no shortcomings (90% - 100% achievement rate of planned expectations and targets).	SATISFACTORY
5	Satisfactory	Level of achievement presents minor shortcomings (70% - 89% achievement rate of planned expectations and targets).	

[15] 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

4	Moderately satisfactory	Level of achievement presents moderate shortcomings (50% - 69% achievement rate of planned expectations and targets).	
3	Moderately unsatisfactory	Level of achievement presents some significant shortcomings (30% - 49% achievement rate of planned expectations and targets).	UNSATISFACTORY
2	Unsatisfactory	Level of achievement presents major shortcomings (10% - 29% achievement rate of planned expectations and targets).	
1	Highly unsatisfactory	Level of achievement presents severe shortcomings (0% - 9% achievement rate of planned expectations and targets).	

IV. Evaluation process

The evaluation will be conducted from April to mid- June 2022. The evaluation will be implemented in five phases which are not strictly sequential, but in many cases iterative, conducted in parallel and partly overlapping:

i. Inception phase: The evaluation team will prepare the inception report providing details on the methodology for the evaluation and include an evaluation matrix with specific issues for the evaluation; the specific site visits will be determined during the inception phase, taking into consideration the findings and recommendations of the mid-term review.

ii. Desk review and data analysis;

iii. Interviews, survey and literature review;

iv. Country visits;

v. Data analysis and report writing.

V. Time schedule and deliverables

The evaluation is scheduled to take place from April to mid-June 2022. The evaluation field mission is tentatively planned for 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 North Macedonia. The tentative timelines are provided in Table 7.

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 4 to 6 weeks after the end of the mission. The draft TE report is to be shared with the UNIDO PM, UNIDO Independent Evaluation Division, the UNIDO GEF Coordinator and GEF OFP and other stakeholders for receipt of comments. The evaluation team 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 7. Tentative timelines

Timelines	**Tasks**
April 2022	Desk review and writing of inception report
End of April 2022	Briefing with UNIDO project manager and the project team based in Vienna and Skopje through Skype or equivalent
May 2022	Field visit to North Macedonia (programme stakeholders and beneficiaries)

End of May 2022	Debriefing in Vienna Preparation of first draft evaluation report
June 2022	Internal peer review of the report by UNIDO's Independent Evaluation Division and other stakeholder comments to draft evaluation report
15th June 2022	Final evaluation report

VI. Evaluation team composition

The evaluation team will be composed of one international evaluation consultant acting as the team leader and one national evaluation consultant. The evaluation team members will possess relevant strong experience and skills on evaluation management and conduct together with expertise and experience in energy efficiency and/or clean energy technologies. Both consultants will be contracted by UNIDO.

The tasks of each team member are specified in the job descriptions annexed to these terms of reference. The evaluation team is required to provide information relevant for follow-up studies, including terminal evaluation verification on request to the GEF partnership up to three years after completion of the TE.

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 North Macedonia 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 UNIDO Independent Evaluation Division will provide technical backstopping to the evaluation team and ensure the quality of the evaluation. The UNIDO Project Manager and national project team will act as resourced persons and provide support to the evaluation team and the evaluation manager.

VII. Reporting

Inception report

This Terms of Reference (ToR) provides some information on the evaluation methodology, but this should not be regarded as exhaustive. After reviewing the project documentation and initial interviews with the project manager, the Team Leader will prepare, in collaboration with the national consultant, a short inception report that will operationalize the ToR relating to the evaluation questions and provide information on what type of and how the evidence will be collected (methodology). It will be discussed with and approved by the responsible UNIDO 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"); division of work between the International Evaluation

Consultant and national consultant; mission plan, including places to be visited, people to be interviewed and possible surveys to be conducted and a debriefing and reporting timetable[16].

Evaluation report format and review procedures

The draft report will be delivered to UNIDO's Independent Evaluation Division (the suggested report outline is in Annex 4) and circulated to UNIDO staff and national stakeholders associated with the project for factual validation and comments. Any comments or responses, or feedback on any errors of fact to the draft report provided by the stakeholders will be sent to UNIDO's Independent Evaluation Division for collation and onward transmission to the project evaluation team who will be advised of any necessary revisions. On the basis of this feedback, and taking into consideration the comments received, the evaluation team will prepare the final version of the terminal evaluation report.

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

The TE report should be brief, to the point and easy to understand. It must explain the purpose of the evaluation, exactly what was evaluated, and the methods used. 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 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 and follow the outline given in Annex 4.

VIII. Quality assurance

All UNIDO evaluations are subject to quality assessments by UNIDO Independent Evaluation Division. Quality assurance and control is exercised in different ways throughout the evaluation process (briefing of consultants on methodology and process of UNIDO Independent Evaluation Division, providing inputs regarding findings, lessons learned and recommendations from other UNIDO evaluations, review of inception report and evaluation report by UNIDO's Independent Evaluation Division).

The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality, enclosed as Annex 5. The applied evaluation quality assessment criteria are used as a tool to provide structured feedback. UNIDO Independent Evaluation Division should ensure that the evaluation report is useful for UNIDO in terms of organizational learning (recommendations and lessons learned) and is compliant with UNIDO's evaluation policy and these terms of reference. The draft and final evaluation report are reviewed by UNIDO Independent Evaluation Division, which will submit the final report to the GEF Evaluation Office and circulate it within UNIDO together with a management response sheet.

[16] The evaluator will be provided with a Guide on how to prepare an evaluation inception report prepared by the UNIDO ODG/EVQ/IEV.

Annex 1: Project Results Framework

[Editorial note: The Project Results Framework was removed from the Terms of Reference and can be found in Annex v of this Terminal Evaluation Report.]

Annex 2: Detailed questions to assess evaluation criteria

Please see Annex 2 of the UNIDO Evaluation Manual
https://www.unido.org/sites/default/files/files/2018-04/Evaluation%20Manual%20e-book.pdf

Annex 3: Job descriptions

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

Title:	International evaluation consultant, team leader
Main Duty Station and Location:	Home-based
Missions:	Missions to Vienna, Austria and Colombia
Start of Contract (EOD):	15th March 2022
End of Contract (COB):	15th June 2022
Number of Working Days:	30 working days spread over the above mentioned period

1. ORGANIZATIONAL CONTEXT

The UNIDO Independent Evaluation Division (ODG/EIO/IED) is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides factual information about result and practices that feed into the programmatic and strategic decision-making processes. Independent evaluations provide evidence-based information that is credible, reliable and useful, enabling the timely incorporation of findings, recommendations and lessons learned into the decision-making processes at organization-wide, programme and project level. ODG/EIO/IED is guided by the UNIDO Evaluation Policy, which is aligned to the norms and standards for evaluation in the UN system.

2. PROJECT CONTEXT

Detailed background information of the project can be found in the terms of reference (TOR) for the terminal evaluation.

MAIN DUTIES	Concrete/ Measurable Outputs to be achieved	Working Days	Location
1. Review project documentation and relevant country background information. Identify key information and data to collect/validate in the field and adjust the key data collection instruments as needed or appropriate Liaise and coordinated evaluation planning with the national evaluation consultant. In consultation with project manager, project management team and national evaluation consultant identify sites to be visited and stakeholders to be interviewed.	• Adjusted table of evaluation questions, depending on country specific context; • Draft list of stakeholders to interview during the field missions. • Identify issues and questions to be addressed by the evaluation team	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, confirm the evaluation methodology, draft theory of change, and tentative agenda for field work. Liaise with the national evaluation consultant to distribute tasks and responsibilities.	• Draft evaluation framework and theory of change to submit to the Evaluation Manager. • Joint-work plan with national evaluation consultant.	4 days	Home based
3. Online briefing with the UNIDO Independent Evaluation Division, project manager and other key stakeholders at UNIDO HQ (included is preparation of presentation).	• Detailed evaluation schedule with tentative mission agenda (incl. list of stakeholders to interview and site visits); mission planning; • Division of evaluation tasks with the National Consultant.	1.5 days	Home based
4. Conduct field mission to North Macedonia in May 2022[17].	• Conduct meetings with relevant project stakeholders, beneficiaries, the GEF Operational Focal Point (OFP), etc. for the collection of information, data and clarifications; • Agreement with the National Consultant on the structure and content of the evaluation report and the distribution of writing tasks; • Presentation of evaluation's preliminary findings, conclusions and recommendations to stakeholders in the country, including the GEF OFP, at the end of the mission.	6 days	Skopje and another city

[17] The exact mission dates will be decided in agreement with the Consultant, UNIDO HQ, and the country counterparts.

MAIN DUTIES	Concrete/ Measurable Outputs to be achieved	Working Days	Location
5. (Online) Debriefing of field mission and presentation of evaluation's preliminary findings, conclusions and recommendations to stakeholders at UNIDO HQ	• Presentation of evaluation's preliminary findings, conclusions and recommendations to stakeholders and UNIDO • Additional slides/short presentation summarizing field mission and key feedback obtained from and discussed with beneficiaries and stakeholders	1.5 days	Vienna, Austria or Home based (TBD)
6. Prepare and submit draft evaluation report, with inputs from the National Consultant, according to the TOR; Coordinate inputs from the National Consultant and combine with her/his own inputs into the draft evaluation report. Share the draft evaluation report with UNIDO HQ and national stakeholders for feedback and comments.	• Draft evaluation report prepared and submitted to UNIDO Evaluation Manager	8 days	Home-based
7. Revise the draft evaluation report based on comments from UNIDO Independent Evaluation Division, Project team and other stakeholders and edit the language and form of the final version according to UNIDO standards.	• Final evaluation report prepared and submitted to UNIDO Evaluation Manager	3 days	Home-based
	TOTAL Working Days	**30**	

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/QUALIFICATION REQUIREMENTS

Education: Master or higher degree in engineering or related specific discipline.

Technical and Functional Experience:

1. Minimum of 8 years' experience in evaluation of development and/or energy projects and programmes
2. Good knowledge in the fields of climate change and energy, including working knowledge of industrial energy efficiency
3. Knowledge about GEF operational programs, strategies and relevant GEF policies, as well as of UNIDO activities is an asset
4. Knowledge about multilateral technical cooperation and the UN, international development priorities and frameworks
5. Working experience in developing countries

Languages: Fluency in written and spoken English is required. All reports and documents produced 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 UNIDO Independent Evaluation Division.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

Title:	National evaluation consultant
Main Duty Station and Location:	Home-based
Mission/s to:	Travel to potential sites within Colombia
Start of Contract:	1st April 2022
End of Contract:	15th June 2022
Number of Working Days:	27 days spread over the above mentioned period

ORGANIZATIONAL CONTEXT

The UNIDO Independent Evaluation Division (ODG/EIO/IED) is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides factual information about result and practices that feed into the programmatic and strategic decision-making processes. Independent evaluations provide evidence-based information that is credible, reliable and useful, enabling the timely incorporation of findings, recommendations and lessons learned into the decision-making processes at organization-wide, programme and project level. ODG/EIO/IED is guided by the UNIDO Evaluation Policy, which is aligned to the norms and standards for evaluation in the UN system.

PROJECT CONTEXT

The national evaluation consultant will evaluate the projects according to the terms of reference (TOR) under the leadership of the team leader (international evaluation consultant). S/he will perform the following tasks:

MAIN DUTIES	**Concrete/measurable outputs to be achieved**	**Expected duration**	**Location**
1. Desk review Review and analyze project documentation and relevant country background information; in cooperation with the team leader, determine key data to collect in the field and prepare key instruments in English (questionnaires, logic models);	• Evaluation questions, questionnaires/interview guide, logic models adjusted to ensure understanding in the national context;	6 days	Home-based

MAIN DUTIES	**Concrete/measurable outputs to be achieved**	**Expected duration**	**Location**
If need be, recommend adjustments to the evaluation framework and Theory of Change in order to ensure their understanding in the local context. Assist with detailed country and project analysis and inputs to the team leader.	• A stakeholder mapping, in coordination with the project team.		
2. Liaise with the team leader to coordinate inputs to Inception Report, evaluation planning and distribution of tasks and responsibilities.	• Inputs to Inception Report preparation provided to team leader • Evaluation joint-work plan with team leader prepared	2 days	Home-based
3. Coordinate the evaluation mission agenda, ensuring and setting up the required meetings with project partners and government counterparts, and organize and lead site visits, in close cooperation with project management team in the field.	• Detailed evaluation schedule. • List of stakeholders to interview during the field missions.	2 days	Home-based
4. Coordinate and conduct the field mission with the team leader in cooperation with the Project Management Unit, where required. Consult with the Team Leader on the structure and content of the evaluation report and the distribution of writing tasks. Conduct translation for the Team Leader, when needed.	• Presentations of the evaluation's initial findings, draft conclusions and recommendations to stakeholders in the country at the end of the mission. • Agreement with the Team Leader on the structure and content of the evaluation report and the distribution of writing tasks.	7 days	Skopje + another city
5. Follow up with stakeholders regarding additional information promised during interviews Prepare inputs to help fill in information and analysis gaps (mostly related to technical issues) and to prepare of tables to be included in the evaluation report as agreed with the Team Leader. Contribute to the revision of the draft project evaluation report based on comments from UNIDO Independent Evaluation Division and stakeholders and proof read the final version.	• Revised parts of draft evaluation report prepared and additional data/analysis provided	10 days	Home-based
	TOTAL Working Days	**27**	

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 university degree in environmental science, engineering or other relevant discipline.

Technical and functional experience:

1. Excellent knowledge and competency in the field of industrial energy efficiency
2. Minimum of 8 years of experience in evaluation, including evaluation of development cooperation projects
3. Exposure to the needs, conditions and problems in developing countries.
4. Familiarity with the institutional context of the project is desirable.

Languages: Fluency in written and spoken Macedonian and English is required. All reports and documents contributed to/produced 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 UNIDO Independent Evaluation Division.

Annex 4- Outline of the Final 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

7. Annexes (to be put online separately later)

i. Evaluation Terms of Reference

ii. Evaluation framework

iii. List of documentation reviewed

iv. List of stakeholders consulted

v. Project logframe/Theory of Change

vi. Primary data collection instruments: evaluation survey/questionnaire

vii. Statistical data from evaluation survey/questionnaire analysis

Annex 5: 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 6: 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. Evaluation managers/evaluators should select relevant questions depending on the type of interventions.

B. Gender responsive evaluation questions

The questions below will help evaluation managers/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 analyse 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?

Annex ii. Evaluation Framework

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

Annex iii. List of Documents Reviewed and References

Project Documents Reviewed

Title or Description of documents	Year(s)
Project preparation documents	
Request for CEO Endorsement Document, incl. Annexes A-H	2014
Tool for the calculation of direct and indirect GHG emission savings (Excel)	2014
GEF-Energy Efficiency Tool to calculate indirect Top-Down Impacts (energy and GHG emission saving)	2014
Co-Financing commitment letters by all country stakeholders which have committed themselves to provide cash and/or in-kind co-financing	2014
GEF Secretariat Review for full/medium-sized projects	2012
STAP Scientific and Technical screening of the Project Identification Form (PIF)	2012

Title or Description of documents	Year(s)
Project Identification Form (PIF)	2012
Project Preparation Grant (PPG)	2012
Back-to-office mission report (mission report to Skopje in the frame of proposal preparation)	2011
STRATEGY for Improvement of the Energy Efficiency in the Republic of Macedonia until 2020, Ministry of Economy	2010
Project reports and other project administrative documents	
Project Advisory Committee Meeting Documents (presentations and minutes)	All project years
Project Implementation Reports with Annexes	Fiscal Years 2016-2021
Narrative Report of activities conducted from July 2020 – July 2021	2021
8th UNIDO Annual Progress Report (Excel; contains all progress reports of the previous years)	2019
ToR FOR PERSONNEL UNDER MULTI-PROJECTS FUNDED INDIVIDUAL SERVICE AGREEMENT (ISA) - National UNFCC-IPCC Specialist	Not indicated
ToR for Technical Specifications for Compressed-Air Systems Measuring Equipment	Not indicated
ToR for Technical Specifications for Steam Systems Measuring Equipment	Not indicated
ToR for Services for establishing and operating a Technical Assistance Facility (TAF) for industrial energy efficiency investments	2021
Final list of expenditures by outcomes and outputs (Excel)	2022
Co-financing calculation table (Excel) for co-financing materialized under the implementation of the EnMS, CASO and SSO Expert and User trainings and UNIDO	2022
Documents produced under or related to project Component 1	
Law on Energy Efficiency (English translation)	2020
Rulebook on Energy Audits of Large Enterprises- Draft	2022
Adult education programme form “Energy Management Practitioner (EnMP)” (English translation)	2020
Decision of the Adult Education Centre on the verification of the Adult education programme “Energy Management Practitioner (EnMP)” (Macedonian and English translation)	2021
Various presentations held at the event “The business case for energy efficiency in North Macedonian industries” held on 21 November 2019 in Skopje by various companies, UNIDO, and the Ministry of Economy	2019
List of participants of the event “The business case for energy efficiency in North Macedonian industries” held on 21 November 2021 in Skopje	2021

Title or Description of documents	Year(s)
Various outcome reports and list of presence of the workshop on the implementation of Articles 7, 8 and 16 of the EU Energy Efficiency Directive.	2017
Website: Industrial Energy Efficiency Best Practice Information and Dissemination Platform; https://mkiee.ea.gov.mk/; last accessed on 20 August 2022	2021
Video clips: 1) Energy Management Systems (Long version); 2) Energy Managements Systems (Short version); 3) Steam System Optimization and Compressed Air System Optimization.	Not indicated
Terms of Reference (ToR): Expert Services for an Assessment of Climate Technologies potential in North Macedonian industry	Not indicated
Contract no. 3000099667 between UNIDO and MACEF for the provision of the "Assessment of Climate Technologies Potential in industry"	2020
Draft questionnaire for the telephone/online assisted survey among big and medium-sized enterprises held in the frame of the "Assessment of Climate Technologies Potential in industry"	2021
USAID Industrial Management Project; FIRST QUARTERLY REPORT: January 1, 2016 – March 31, 2016	2016
Documents produced under or related to project Component 2	
Case studies on Energy Management Systems (Alkaloid, Joka, Makstil, REK Bitola)	Various years
Final reports on EnMS implementation (Alkaloid, Arcelor Mittal, Johnson Matthey, Joka, Knauf, Makstil, REK Bitola, Bulmak Toranica, Comfy Angel, EVN, Sistina, Vardar)	Various years
Assessment reports on CASO implementation (Alkaloid, DS Smith, LEAR, Knauf, Comfy Angel)	Various years
Assessment reports on SSO implementation (Alkaloid, ELEM, Joka, Kogel, REK Bitola, Skopje Brewery)	Various years
Presentations on EnMS implementation (various companies)	Various years
Presentations on CASO implementation (various companies)	Various years
Lists of presence for implemented trainings (EnMS Expert and User Trainings, CASO and SSOU training)	Various years
Progress Tracking Reports of 16 partner companies (Final industry survey 2022)	2022
SSO Expert Training Feedback Assessment	2015
BENEFITS ANALYSIS OF PILOT UNIDO EnMS CBI PROGRAMME (Excel table in which energy, monetary and GHG emission reduction savings of pilot partner companies (EnMS) were calculated)	2016
Documents produced under or related to project Component 3	
Proposal for establishing and operating a Technical Assistance Facility (TAF) for industrial energy efficiency investments	2021

Title or Description of documents	Year(s)
Brochure: Technical Assistance Facility (TAF) and Performance-Based Cash Incentive (PCI) for Industrial Energy Efficiency (IEE) investments	Not indicated
TAF and PCI Application Form	Not indicated
Application forms and/or contract documents of four companies	2022
Loan contract for one company which was accepted for the TAF grant/PCI reward	2022
Training agenda and lists of presence of the two-day training on the implementation of the TAF	2021
Training concept of the one-day training on TAF/PCI for bank officers	2021
Documents related to gender mainstreaming	
Women in Energy (Efficiency) Management Systems in industry – Case study report (Author: Dr. Marija Risteska)	2019
Baseline report: Gender Mainstreaming of the Project: Energy Efficiency in Industry (Author: Dr. Marija Risteska; Centre for Research and Policy Making Skope)	2013

Other References

Astghine Pasoyan, Virgil Musatescu, Konstantin Dimitrov, Nikola Krstanovski, Boshko Nikov, Ognen Dimitrov, Igor Petrusevski, Zarko Ilievski, Makedonka Andonova, Jasminka Dimitrova Kapac, Bojan Kalimanov, and Jovan Hristoski. 2010. *Strategy for Improvement of the Energy Efficiency in the Republic of Macedonia until 2020*.

Government of the RNM. 2021. *Fourth National Energy Efficiency Action Plan of the Republic of North Macedonia*. Skopje.

International Energy Agency. 2022. "Energy Data and Statistics of the International Energy Agency (IEA)." Retrieved August 26, 2022 (https://www.iea.org/countries/north-macedonia).

Natasa Markovska, Gligor Kanevche, Aleksandar Dedinec, Verica Taseska Gjorgievska, Aleksandra Dedinec, and Emilija Mihajloska. 2019. *Study on Industry Analysis of Policies and Measures (STUIND)*. Skopje: Research Center for Energy and Sustainable Development - Macedonian Academy of Science and Arts.

UNIDO. 2018. *Evaluation Manual*. Vienna: UNIDO - Office of Evaluation and Internal Oversight Independent Evaluation Division.

World Bank. 2022. *World Bank Open Data*. Retrieved August 29, 2022 (https://data.worldbank.org/).

Annex iv. List of Stakeholders Consulted

Name	Organisation	Position	Role in project	Location
UNIDO and Executing Agencies				
Marco MATTEINI	UNIDO	Industrial Development Officer	UNIDO Project Manager	Vienna, Austria
Ana PETROVSKA	Formerly REC Country Office Macedonia (now Ministry of Environment and Physical Planning)	Project manager	National Project Manager	Skopje, MK
Mina DAMJANOVIC-ALTANDZIEVA	REC Country Office Macedonia	Project assistant	Project assistant	Skopje, MK
Tamara RADOVANOVIK	REC Country Office Macedonia	Project assistant	Project Assistant	Skopje, MK
Other National Executing Partners				
Teodora GRNCAROVSKA OBRADOVIKJ	Ministry of Environment and Physical Planning	State Counsellor on Climate Change	Member of the Project Advisory Committee	Skopje, MK
Valentina STARDELOVA	Ministry of Economy	Head of the Energy Department	Member of the Project Advisory Committee	Skopje, MK
Panche ATANASOVSKI	Energy Agency of the Republic of North Macedonia	Advisor for energy efficiency and renewable resources	Member of the Project Advisory Committee	Skopje, MK
Partner companies, bank				
Toni SRBINOVSKI	Alkaloid	Energy manager	Representative of partner company	Skopje, MK
Trajche KRALESKI	Comfy Angel (Prilep)	Electrical maintenance engineer	Representative of partner company	Prilep, MK
Zoran RISTESKI	Comfy Angel (Prilep)	Electrical engineer	Representative of partner company	Prilep, MK
Stefan PETER	EVN Macedonia	CEO and President of the Management Board	Representative of partner company	Skopje, MK
Roland ZIEGLER	EVN Macedonia	Managing Director	Representative of partner company	Skopje, MK
Nikola USHINOV	EVN Macedonia	Head of Energy planning and procurement department	Representative of partner company	Skopje, MK
Vlatko PETROVSKI	Titan Usje Cementara	Mechanical Maintenance Engineer	Representative of partner company	Skopje, MK
National IEE consultants				
Zlatko GJURCINOVSKI	Freelance consultant	N/A	National IEE expert	Skopje, MK
Mirko RISTEVSKI	JSC Macedonian Power Plants Branch REK Bitola	Responsible engineer for automation	National IEE expert; Representative of partner company, trainer	Skopje, MK
Goran TANCEVSKI	GTTP Grupacija Skopje	General Manager	National IEE expert	Skopje, MK
Daniela MLADENOVSKA	JSC Macedonian Power Plants	Chief engineer for thermal power	National IEE expert; Representative of partner company	Skopje, MK

Name	Organisation	Position	Role in project	Location
Ana M. LAZAREVSKA	Sts Cyril and Metdhodius University in Skopje; Faculty of Mechanical Engineering	Full Professor	Representative of partner university; national IEE consultant trained in the project and trainer in the project	Skopje, MK
Other stakeholders and partners				
Nevenka SAZDOVA	NLB Banka	Sales Coordinator at NLB Banka	Stakeholder trained in the project	Skopje, MK
Filip ZAFIROVSKI	NLB Banka	Senior Officer at NLB Banka	Stakeholder trained in the project	Skopje, MK
Liam MC LAUGHLIN	Gen EUROPE	Chief Technical Officer	Trainer in the EnMS Expert trainings	Castle-townshend, IE
Simon AVRAMOVSKI	PointPro Consulting	Partner, Practice Leader Management Consulting & Corporate Finance	Financial consultant to the project	Skopje, MK
Dragan BLAZEV	TIMELPROEKT DOOEL	Director, Business Development	Consultant to the USAID LED-CEI project	Skopje, MK

Annex v. Project Results Framework

	Intervention logic	Objectively verifiable indicators	Sources of verification	Assumptions
Development goal/impact	To accelerate market transformation for industrial energy efficiency by strengthening policy, regulatory and institutional frameworks and supporting increased diffusion of and investment in best available industrial energy efficiency practices and technologies.	✓ No. of enterprises with EnMS implemented ✓ 67,000 t $CO_{2\ eq}$ - direct GHG emission savings ✓ 66,000 t $CO_{2\ eq}$ - indirect GHG emissions savings over 10 years ✓ Involvement of at least 20% of women in all awareness event and training programs	✓ Final independent evaluation ✓ Government reports and statistics	Macedonian Government medium- and long-term commitment to the Energy Community Treaty and to strengthen the national policy frameworks for energy, EE and environment. Energy costs reduction remains and becomes a priority for many manufacturing enterprises.
Outcome 1	Enhanced promotion and support of sustainable industrial energy efficiency by strengthened policy and regulatory frameworks and market-based mechanisms	✓ Elements of the Macedonian Programmatic Framework for IEE (i.e. policies, regulations, programs) ✓ Extent which policies, regulations and programs are adopted and enforced (score 0 to 4)	✓ Final independent evaluation ✓ Government communication and reports	Government continues to support EE & enforces policies, regulations & programs. Growing industry demand for EE as result of increased awareness of its benefits & sustained high energy prices Commercial interest from private and financial sector
Output 1.1	Legal requirements for large industrial and public sector energy consumers to have a certified Energy Management Practitioner (EnMP) is developed and enacted	✓ Macedonian bylaws for EnMP/IEE	✓ Register of national laws ✓ Final independent evaluation	Government remains strongly committed to support EE policies, regulations and programs, and to the project activities Most medium-size and large enterprises recognize economic value of energy management
Output 1.2	Certification Program for Energy Management Practitioner (EnMP) is developed and enacted	✓ Extent to which such Program is established (score of 0 to 4)	✓ Government ✓ Final independent evaluation	Same as Output 1.1.
Output 1.3	Financial incentive for ISO 50001 Certification are developed and enacted	✓ Extent to which the incentive is introduced (score of 0 to 4)	✓ Min. of Economy ✓ Final independent evaluation	Same as Output 1.1. International standards are recognized as competitiveness enhancing tools
Output 1.4	Industrial Energy Efficiency (IEE) Best Practice Information and Dissemination (BPID) Program established and operational	✓ IEE-BPID website established (score of 0 to 4) ✓ IEE-BPID workshops organized (score of 0 to 4)	✓ Project Implem. Report (PIR) ✓ Final independent evaluation	Government remains strongly committed to support EE policies, regulations and programs, and to the project activities Enterprises recognize the importance of information and knowledge about what is feasible to save energy and money

	Intervention logic	Objectively verifiable indicators	Sources of verification	Assumptions
Output 1.5	Industrial Energy Data Management Framework developed	✓ Extent to which the Framework is developed (score of 0 to 4)	✓ Project Implem. Report (PIR) ✓ Final independent evaluation	Government remains strongly committed to support EE policies, regulations and programs, and to the project activities
Output 1.6	Assessment of Climate Technologies potential in industry	✓ No. of Government led needs assessments for climate technologies for the manufacturing sector	✓ Government reports ✓ Public media ✓ Final independent evaluation	Government remains committed to active participation in the UNFCCC CTCN and to enhance its work to promote transfer and adoption of climate technologies in industry
Output 1.7	Strengthened technical capacity of Macedonian institutions responsible for developing, implementing and monitoring energy efficiency and climate change mitigation policies and programs and 25 public officials trained	✓ No. of officials trained ✓ No. of women officials trained	✓ Project Implem. Report (PIR) ✓ Final independent evaluation	Government remains strongly committed to support EE policies, regulations and programs, and to the project activities
Outcome 2	Adoption of energy and environment management systems leading to greater resource investments in energy efficiency measures and low carbon technologies, an increased energy productivity and competitiveness of the Macedonian industries	✓ No. of enterprises implementing Energy Management Systems in line with ISO 50001 ✓ No. of enterprises implementing other EE and low carbon BAP and BAT ✓ Resources invested in EnMS/ ESO/ EE implementation ✓ No. of EE service providers offering EnMS and ESO services	✓ Final independent evaluation ✓ Market surveys	Government continues to support EE &enforces policies, regulations & programs. Growing industry demand for EE as result of increased awareness of its benefits & sustained high energy prices Commercial interest from private and financial sector

	Intervention logic	Objectively verifiable indicators	Sources of verification	Assumptions
Output 2.1	2. A group of 50 local energy efficiency and environment professionals are equipped with the technical expertise and tools required to: i. Implement in industry Energy Management Systems (EnMS) in line with ISO 50001 ii. Carry out industrial energy system optimization assessments iii. Train industry personnel in EnMS and energy system assessment & optimization iv. Offer EnMS, energy system assessment & optimization technical services to industry	✓ No. of local energy efficiency and environment professionals trained ✓ No. of local EE consultants/ service providers offering EnMS services and type of services (score of 0 to 4) ✓ No. of local EE consultants/ service providers offering CASO and SSO services and type of services (score of 0 to 4) ✓ No. of women EE consultants/service provided trained ✓	✓ Project Implem. Report ✓ Market survey ✓ Final independent evaluation	Government continues to support EE & enforces policies, regulations & programs. Growing industry demand for EE as result of increased awareness of its benefits & sustained high energy prices Local EE consultants and service providers recognize the business opportunity and market potential for EnMS and ESO in Macedonia Project partners support project activities and fulfil their co-financing commitments
Output 2.2	Ten (10) enterprises from key Macedonian industrial sectors implement Energy Management Systems in line with ISO 50001.	✓ No. of enterprises implementing Energy Management Systems in line with ISO 50001	✓ Project Implem. Report ✓ Final independent evaluation	Partner enterprises fulfil their active participation and co-financing commitments
Output 2.3	At least ten (10) low cost energy efficiency projects are implemented by industrial enterprises as result of their participation in the Training programs of the project.	✓ No. of enterprises implementing low costs EnMS/ ESO/ EE projects ✓ Resources invested in EnMS/ ESO/ EE implementation ✓	✓ Project Implem. Report ✓ Final independent evaluation ✓ Partner enterprises	Partner enterprises fulfil their active participation and co-financing. Commercial interest in EnMS/ ESO/ EE projects from the financial sector.
Output 2.4	Five (5) enterprises from key Macedonian industrial sectors implement integrated Energy and Environment Management Systems in line with ISO 50001 and ISO 14001	✓ No. of enterprises implementing integrated ISO 50001 and ISO 14001 and to what extent (score of 0 to 4)	✓ Project Implem. Report ✓ Final independent evaluation	Growing industry demand for EE as result of increased awareness of its benefits & sustained high energy prices Partner enterprises fulfil their active participation and co-financing commitments
Output 2.5	Top management of at least fifty (50) enterprises understands the economic and environmental benefits of energy efficiency and is made aware of key relevant commercial best-available practices and technologies.	✓ Attendance of project seminars and round tables ✓ No. of women managers attending	✓ Project Implem. Report ✓ Final independent evaluation	Energy costs reduction remains and becomes a priority for many manufacturing enterprises.

	Intervention logic	Objectively verifiable indicators	Sources of verification	Assumptions
Output 2.6	Personnel of fifty (50) enterprises receive training on the implementation of energy management systems and on energy system optimization measures.	✓ No. of enterprises personnel attending EnMS or ESO 2-day trainings ✓ No. of women attending/receiving the training	✓ Project Implem. Report ✓ Final independent evaluation	Government continues to support EE & enforces policies, regulations & programs. Growing industry demand for EE as result of increased awareness of its benefits & sustained high energy prices. Project partners support project activities and fulfil their co-financing commitments.
Outcome 3	Adoption of energy efficient and low carbon process/ sector specific technologies	✓ No. of enterprises implementing EE and low carbon BAP and BAT projects ✓ Resources invested in IEE projects implementation	✓ Final independent evaluation	Government continues to support EE & enforces policies, regulations & programs. Increased demand for EE as result of progressive removal of energy subsidies Commercial interest in IEE projects from financial sector
Output 3.1	Technical assistance facility to support IEE investments is developed and established	✓ No. of IEE investments supported ✓ Rate of implementation of IEE investments supported	✓ Project Implem. Report ✓ Final independent evaluation ✓ MBDP	Project partners support project activities and fulfil their co-financing commitments. Growing industry demand for EE as result of increased awareness of its benefits & sustained high energy prices. Commercial interest in IEE projects from financial sector.
Output 3.2	At least fifteen (15) local EE consultants trained in IEE investments preparation	✓ No. of EE consultants attending the training	✓ Project Implem. Report ✓ Final independent evaluation	Local EE consultants and service providers recognize the business opportunity and market potential for IEE in Macedonia.
Output 3.3	At least ten (10) bank lending officers trained in assessing IEE investments proposals	✓ No. of commercial banks attending the training ✓ No. of lending officers attending the training	✓ Project Implem. Report ✓ Final independent evaluation	Commercial interest in IEE projects from financial sector.
Output 3.4	Performance-based financial reward mechanism for IEE investment projects established	✓ No. of applications received ✓ No. of rewards granted ✓ Total value of IEE investments made	✓ Project Implem. Report ✓ Final independent evaluation ✓ MBDP	Growing industry demand for EE as result of increased awareness of its benefits & sustained high energy prices. Enterprises' sensitivity to cash incentives Commercial interest in IEE projects from financial sector

Annex vi. Primary Data Collection Instruments: Online Survey among national IEE consultants (questionnaire)

Q1 - In which Expert Trainings of the UNIDO-REC Industrial Energy Efficiency project did you participate?

Note: Multiple answers possible, please select all those applicable.

1. Energy Management Systems (EnMS)
2. Compressed Air System Optimization (CASO)
3. Steam System Optimization (SSO)

Q2 - In what capacity do you currently offer or apply your expertise in EnMS, CASO, SSO and/or industrial energy efficiency (IEE)?

Note: Multiple answers possible, please select all that apply.

1. As freelance consultant
2. As employee of a consultancy firm
3. As employee in the industry (public or private company)
4. Other: _____ (Please specify)
5. I am currently not working as expert for EnMS/SSO/CASO/IEE.

Q3 - Did you support an enterprise in conducting energy system optimization (CASO or SSO) assessment during the multi-month training?

Note: Only one answer possible.

1. Yes
2. No

Q3 - If yes, please specify on which kind of system you conducted energy system optimization ((CASO or SSO) assessment during the multi-month training?

Note: Multiple answers possible, please select all those applicable.

1. Compressed-air System Optimization (CASO)
2. Steam System Optimization (SSO)

Q4 - Did you support an enterprise in implementing an energy management system (EnMS) in line with ISO 50001, compressed air system optimization (CASO), steam system optimization (SSO) or other industrial energy efficiency measures during the multi-month training?

Note: Only one answer possible.

1. Yes
2. No

Q4 - If yes, please specify which kind of measure you implemented in an enterprise during the multi-month training:

Note: Multiple answers possible, please select all those applicable.

1. EnMS in line with ISO 50001
2. SSO measures
3. CASO measures
4. Other: _____ (Please specify)

Q5 A) To what extent do you agree with the following statements about the UNIDO Energy Management System (EnMS) Expert Training that you have attended?

(1) The training contents met my expectations.
(2) The classroom training sessions were interactive and engaging.
(3) The online monitoring and coaching sessions were interactive and useful.
(4) The training sessions were well-structured and could be easily followed.
(5) The classroom/ online training sessions prepared me for the tasks in the partner enterprise.
(6) During the practical phases in the partner enterprise(s), I have received sufficient technical support from UNIDO trainers to successfully fulfill my task(s).
(7) The partner enterprise I worked with provided the resources (staff and materials) needed to fulfill the assigned tasks.
(8) After the EnMS Expert Training programme I felt more competent and confident to fulfill my role as EnMS consultant, or as energy manager.
(9) The EnMS training and programme created a mutually beneficial professional network with other EnMS/industrial energy efficiency experts.

1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

Q5 B) To what extent do you agree with the following statements about the UNIDO Steam System Optimization (SSO) Expert Training that you have attended?

(1) The training contents met my expectations.
(2) The classroom training sessions were interactive and engaging.
(3) The online coaching sessions were interactive and useful.
(4) The training sessions were well-structured and could be easily followed.
(5) The classroom/ online training sessions prepared me for the tasks in the partner enterprise.
(6) During the practical phases in the partner enterprise, I have received sufficient technical support from UNIDO trainers to successfully fulfill my task(s).
(7) The availability of the UNIDO project's measuring equipment provided was useful to upgrade my skills.
(8) The partner enterprise I worked with provided the resources (staff and materials) needed to fulfill the assigned tasks.
(9) After the SSO Expert Training programme I felt more competent and confident to fulfill my role as SSO consultant, or as energy manager.
(10) The SSO training and programme created a mutually beneficial professional network with other SSO/industrial energy efficiency experts.

1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

Q5 C) To what extent do you agree with the following statements about the UNIDO Compressed Air System Optimization (CASO) Expert Training that you have attended?

(1) The training contents met my expectations.
(2) The classroom training sessions were interactive and engaging.
(3) The online training and coaching sessions were interactive and useful.
(4) The training sessions were well-structured and could be easily followed.
(5) The classroom/ online training sessions prepared me for the tasks in the partner enterprise.

(6) During the practical phases in the partner enterprise, I have received sufficient technical support from UNIDO trainers to successfully fulfill my task(s).
(7) The availability of the UNIDO project's measuring equipment provided was useful to upgrade my skills.
(8) The partner enterprise I worked with provided the resources (staff and materials) needed to fulfill the assigned tasks.
(9) After the CASO Expert Training programme I felt more competent and confident to fulfill my role as CASO consultant, or as energy manager.
(10) The CASO training and programme created a mutually beneficial professional network with other CASO/industrial energy efficiency experts

1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

Q6 A) How do you assess the balance between theory and practice (in the enterprises) of the UNIDO Energy Management System (EnMS) Expert Trainings?

Note: Only one possible answer

1. There was an excellent balance between theory and practice.
2. There was a good balance between theory and practice.
3. More theoretical input would have been needed.
4. More practical work would have been needed.

Q6 B) How do you assess the balance between theory and practice (in the enterprises) of the UNIDO Steam System Optimization (SSO) Expert Trainings?

Note: Only one possible answer

1. There was an excellent balance between theory and practice.
2. There was a good balance between theory and practice.
3. More theoretical input would have been needed.
4. More practical work would have been needed.

Q6 C) How do you assess the balance between theory and practice (in the enterprises) of the UNIDO Compressed-air System Optimization (CASO) Expert Trainings?

Note: Only one possible answer

1. There was an excellent balance between theory and practice.
2. There was a good balance between theory and practice.
3. More theoretical input would have been needed.
4. More practical work would have been needed.

Q7 A) How do you rate the quality of the following aspects of the UNIDO Energy Management System (EnMS) Expert Training(s)?

(1) Learning content and material
(2) The UNIDO Energy Management System (EnMS) tool
(3) Expertise of the trainer(s)
(4) Overall quality of the training (incl. implementation phases between classroom/online sessions)

1. Excellent
2. Good
3. Fair
4. Poor

Q7 B) How do you rate the quality of the following aspects of the Steam System Optimization (SSO) Expert Training(s)?

(1) Learning content and material
(2) Availability of set of portable equipment for system wide measurements
(3) Expertise of the trainer(s)
(4) Overall quality of the training (incl. implementation phases between classroom/online sessions)

1. Excellent
2. Good
3. Fair
4. Poor

Q7 C) How do you rate the quality of the following aspects of the Compressed-air System Optimization (CASO) Expert Training(s)?

(1) Learning content and material
(2) Availability of set of portable equipment for system wide measurements
(3) Expertise of the trainer(s)
(4) Overall quality of the training (incl. implementation phases between classroom/online sessions)

1. Excellent
2. Good
3. Fair
4. Poor

Q8 A) How much of the training content in the Energy Management System (EnMS) Expert Training was new to you?

Note: Only one answer possible

1. Everything or nearly everything was new to me.
2. About 75% of the content.
3. About half of the content.
4. About 25% of the content.
5. Nothing or nearly nothing was new to me.

When answer 1./2./3. or 4. has been chosen:

Q8 A1) Which was the new training content that was most valuable to you?

Note: Open-ended question. Maximum 300 characters (incl. blanks).

Q8 B) How much of the training content in the Steam System Optimization (SSO) Expert Training was new to you?

Note: Only one answer possible

1. Everything or nearly everything was new to me.
2. About 75% of the content.
3. About half of the content.
4. About 25% of the content.
5. Nothing or nearly nothing was new to me.

When answer 1./2./3. or 4. has been chosen:

Q B1) Which was the new training content that was most valuable to you?

Note: Open-ended question. Maximum 300 characters (incl. blanks).

Q8 C) How much of the training content in the Compressed-air System Optimization (CASO) Expert Training was new to you?

Note: Only one answer possible

1. Everything or nearly everything was new to me.
2. About 75% of the content.
3. About half of the content.
4. About 25% of the content.
5. Nothing or nearly nothing was new to me.

When answer 1./2./3. or 4. has been chosen:

Q8 C1) Which was the new training content that was most valuable to you?

Note: Open-ended question. Maximum 300 characters (incl. blanks).

Q9 - Please share any concerns about the UNIDO Expert Training(s). What was missing, what should have been done differently? Please refer to both the classroom/online trainings and the practical implementation phases in the enterprises.

Note: Open-ended question. Maximum 500 characters (incl. blanks).

Note: Please use the acronyms EnMS or SSO or CASO or ALL to indicate the specific training(s) to which the comments relate to.

Q10 - Did you provide the following consultancy and expert advisory services before the UNIDO Expert trainings?

1. Yes
2. No

Q10 – If yes, which kind of consultancy and expert advisory services did you provide before the UNIDO Expert trainings?

Note: Multiple answers possible, please select all those applicable.

1. EnMS-ISO 50001 training services to industry personnel
2. EnMS-ISO 50001 training services to energy practitioners
3. EnMS-ISO 50001 consultancy in industry (but no implementation)
4. Direct EnMS-ISO 50001 implementation support to industrial enterprises
5. SSO training services to industry personnel
6. SSO training services to energy practitioners
7. SSO assessment services to industrial enterprises (using the UNIDO approach)

8. Expert support for SSO measures/projects development (but no implementation)
9. CASO training services to industry personnel
10. CASO training services to energy practitioners
11. CASO assessment services to industrial enterprises (using the UNIDO approach)
12. Expert support for compressed-air system optimization measures/projects development
13. Other _____ (please specify)

Q11 – How have your professional activities as IEE expert evolved in the fields of EnMS, SSO and/or CASO after attending the UNIDO Expert Trainings? What were the main reasons for this development?

Note: Please use the acronyms EnMS or SSO or CASO or ALL to indicate the specific fields of activity to which the comments relate to.

Open-ended question. (max. 500 characters incl blanks)

Q12 - What was the most valuable aspect of the UNIDO Expert training and support for you? What did it do well?

Note: Open-ended question. Maximum 500 characters (incl. blanks).

Q13 - Is there any other comment or suggestion that you would like to make?

Note: Open-ended question. Maximum 500 characters (incl. blanks).

Annex vii. Statistical Data from Evaluation Survey/Questionnaire analysis

Introduction

The questionnaire was sent to 38 national IEE consultants. Responses were received from 19 consultants.

Results

Q1 - In which Expert Trainings of the UNIDO-REC Industrial Energy Efficiency project did you participate?

	EnMS	CASO	SSO
Yes	14	11	6

Q2 - In what capacity do you currently offer or apply your expertise in EnMS, CASO, SSO and/or industrial energy efficiency (IEE)?

	Count
As freelance consultant	3
As employee of a consultancy firm	3
As employee in the industry (public or private company)	10
I am currently not working as expert for EnMS/SSO/CASO/IEE	4
Other	2
Sales and service of compressor equipment	1
Academy	1

Q3 - Did you support an enterprise in conducting energy system optimization (CASO or SSO) assessment during the multi-month training?

	Count
Yes	12
No	6
N/A	1

Q3 - If yes, please specify on which kind of system you conducted energy system optimization ((CASO or SSO) assessment during the multi-month training?

	CASO	SSO
Yes	11	5
No	1	7
N/A	7	7

Q4 - Did you support an enterprise in implementing an energy management system (EnMS) in line with ISO 50001, compressed air system optimization (CASO), steam system optimization (SSO) or other industrial energy efficiency measures during the multi-month training?

	Count
Yes	16
No	2
N/A	1

Q4 - If yes, please specify which kind of measure you implemented in an enterprise during the multi-month training:

	Count
EnMS in line with ISO 50001	3
SSO measures	3
CASO measures	10
Other	4
Specific energy efficiency measures - waste heat utilisation in technology process	2

Q5 A) To what extent do you agree with the following statements about the UNIDO Energy Management System (EnMS) Expert Training that you have attended?

	Strongly agree	Agree	Disagree	Strongly Disagree	N/A
The training contents met my expectations	9	4	0	0	6
The classroom training sessions were interactive and engaging	9	4	0	0	6
The online monitoring and coaching sessions were interactive and useful	6	4	3	0	6
The training sessions were well-structured and could be easily followed	10	3	0	0	6
The classroom/ online training sessions prepared me for the tasks in the partner enterprise	8	4	1	0	6

During the practical phases in the partner enterprise(s), I have received sufficient technical support from UNIDO trainers to successfully fulfill my task(s).	9	3	1	0	6
The partner enterprise I worked with provided the resources (staff and materials) needed to fulfill the assigned tasks	6	5	1	1	6
After the EnMS Expert Training programme I felt more competent and confident to fulfill my role as EnMS consultant, or as energy manager	9	4	0	0	6
The EnMS training and programme created a mutually beneficial professional network with other EnMS/industrial energy efficiency experts	7	6	0	0	6

Q5 B) To what extent do you agree with the following statements about the UNIDO Steam System Optimization (SSO) Expert Training that you have attended?

	Strongly agree	**Agree**	**Disagree**	**Strongly Disagree**	**N/A**
The training contents my expectations	4	1	0	0	14
The classroom training sessions were interactive and engaging	4	1	0	0	14
The online coaching sessions were interactive and useful	2	2	1	0	14
The training sessions were well-structured and could be easily followed	3	2	0	0	14
The classroom/ online training sessions prepared me for the tasks in the partner enterprise	3	2	0	0	14
During the practical phases in the partner enterprise(s), I have received sufficient technical support from UNIDO trainers to successfully fulfill my task(s).	3	2	0	0	14
The availability of the UNIDO project's measuring equipment provided was useful to upgrade my skills.	3	2	0	0	14
The partner enterprise I worked with provided the resources (staff and materials) needed to fulfill the assigned tasks	3	2	0	0	14

After the SSO Expert Training programme I felt more competent and confident to fulfill my role as SSO consultant, or as energy manager	2	3	0	0	14
The SSO training and programme created a mutually beneficial professional network with other SSO/industrial energy efficiency experts	4	1	0	0	14

Q5 C) To what extent do you agree with the following statements about the UNIDO Compressed Air System Optimization (CASO) Expert Training that you have attended?

	Strongly agree	**Agree**	**Disagree**	**Strongly Disagree**	**N/A**
The training contents my expectations	4	1	0	0	14
The classroom training sessions were interactive and engaging	4	1	0	0	14
The online coaching sessions were interactive and useful	2	2	1	0	14
The training sessions were well-structured and could be easily followed	3	2	0	0	14
The classroom/ online training sessions prepared me for the tasks in the partner enterprise	3	2	0	0	14
During the practical phases in the partner enterprise(s), I have received sufficient technical support from UNIDO trainers to successfully fulfill my task(s).	3	2	0	0	14
The availability of the UNIDO project's measuring equipment provided was useful to upgrade my skills.	3	2	0	0	14
The partner enterprise I worked with provided the resources (staff and materials) needed to fulfill the assigned tasks	3	2	0	0	14
After the CASO Expert Training programme I felt more competent and confident to fulfill my role as CASO consultant, or as energy manager	2	3	0	0	14
The CASO training and programme created a mutually beneficial professional network with other CASO/industrial energy efficiency experts	4	1	0	0	14

Q6 A) How do you assess the balance between theory and practice (in the enterprises) of the UNIDO Energy Management System (EnMS) Expert Trainings?

	Count
There was an excellent balance between theory and practice	7
There was a good balance between theory and practice	2
More theoretical input would have been needed	0
More practical work would have been needed	4
N/A	6

Q6 B) How do you assess the balance between theory and practice (in the enterprises) of the UNIDO Steam System Optimization (SSO) Expert Trainings?

	Count
There was an excellent balance between theory and practice	4
There was a good balance between theory and practice	1
More theoretical input would have been needed	0
More practical work would have been needed	0
N/A	14

Q6 C) How do you assess the balance between theory and practice (in the enterprises) of the UNIDO Compressed-air System Optimization (CASO) Expert Trainings?

	Count
There was an excellent balance between theory and practice	6
There was a good balance between theory and practice	2
More theoretical input would have been needed	0
More practical work would have been needed	2
N/A	9

Q7 A) How do you rate the quality of the following aspects of the UNIDO Energy Management System (EnMS) Expert Training(s)?

	Excellent	Good	Fair	Poor	N/A
Learning content and material	7	5	1	0	6
The UNIDO Energy Management System (EnMS) tool	9	4	0	0	6
Expertise of the trainer(s)	10	3	0	0	6

Overall quality of the training (incl. implementation phases between classroom/online sessions)	9	4	0	0	6

Q7 B) How do you rate the quality of the following aspects of the Steam System Optimization (SSO) Expert Training(s)?

	Excellent	**Good**	**Fair**	**Poor**	**N/A**
Learning content and material	2	3	0	0	14
Availability of set of portable equipment for system wide measurements	3	2	0	0	14
Expertise of the trainer(s)	4	1	0	0	14
Overall quality of the training (incl. implementation phases between classroom/online sessions)	4	1	0	0	14

Q7 C) How do you rate the quality of the following aspects of the Compressed-air System Optimization (CASO) Expert Training(s)?

	Excellent	**Good**	**Fair**	**Poor**	**N/A**
Learning content and material	2	3	0	0	14
Availability of set of portable equipment for system wide measurements	3	2	0	0	14
Expertise of the trainer(s)	4	1	0	0	14
Overall quality of the training (incl. implementation phases between classroom/online sessions)	4	1	0	0	14

Q8 A) How much of the training content in the Energy Management System (EnMS) Expert Training was new to you?

	Count
Everything or nearly everything was new to me	2
About 75% of the content	2
About half of the content	5
About 25% of the content	3
Nothing or nearly nothing was new to me	1
N/A	5

Q8 C1) Which was the new training content that was most valuable to you? (Open-ended question)

Number of Respondent	Response
1.	Planning modul
2.	Identifying Key Performance Indicators and performing regression analyses
3.	Using statistical methods for energy consumption prediction
4.	The concept of regression models and how to use them
5.	The most valuable content for me was 'Planning', regression analysis of the data and all created models.
6.	Presentation of the results of EnMS, regression analysis
7.	ENMs tools: -introduction and barriers to measure energy performance, -development of regression models, -performance monitoring
8.	The baseline model establishing
9.	Energy audits, internal audits, energy performance indicators, the plan-do-check-act cycle, project management basics, Action plans.
10.	Education about regression analysis was the most useful content of the training courses.
11.	Regression models and SWOT analyzes.

Q9 - Please share any concerns about the UNIDO Expert Training(s). What was missing, what should have been done differently? Please refer to both the classroom/online trainings and the practical implementation phases in the enterprises.

Number of Respondent	Response
1.	Everything was perfect
2.	There was a big time gap between the classroom and the practical training. The communication between the UNIDO experts and the local experts was lacking. The condition of the equipment needed for the specific measurements was poor, damaged pressure probes, cables, drills. When the project was finished not all trainees received the CASO experts certificates and not all of them were included in the national list of experts, even though they performed all tasks professionally and very successfully.
3.	CASO: I think that there is need for longer followup of the implementation of the program in the companies in the countrly where the training was conducted in order to have greater impact of the program itself
4.	lack of partner's enterprises commitment (public owned enterprises) for implementation of the EnMS, SSO and CASO
5.	Everything was great. My opinion is that this projects shud continue.

6.	There isn't any concerns
7.	EnMS: Models for short training of energy managers in the enterprises during the implementation of EnMS / SSO: Low pressure systems, production of hot water / CASO: Measurement equipment for large CA systems, waste heat recovery systems
8.	Perhaps it would be better to include more practical examples from more industries as well as purely administrative buildings and business centers …
9.	need harmonisation with EE Directive
10.	More practical expertise measurment
11.	Liam from GEN Europe was the most valuable trainer for EnMS and I was slightly dissatisfied when he was replaced with local experts.
12.	Almost everything was covered by the EnMS trainigs. As an proposal, maybe more practical exercises for different industries need to be realized.
13.	Everything was exceptional
14.	I have no concerns.
15.	I do not have any concern.

Q10 - Did you provide the following consultancy and expert advisory services before the UNIDO Expert trainings?

	Count
Yes	4
No	13
N/A	2

Q10 – If yes, which kind of consultancy and expert advisory services did you provide before the UNIDO Expert trainings?

	Yes	**No**	**N/A**
EnMS-ISO 50001 training services to industry personnel	1	3	15
EnMS-ISO 50001 training services to energy practitioners	1	3	15
EnMS-ISO 50001 consultancy in industry (but no implementation)	1	3	15
Direct EnMS-ISO 50001 implementation support to industrial enterprises	1	3	15
SSO training services to industry personnel	2	2	15
SSO training services to energy practitioners	1	3	15
SSO assessment services to industrial enterprises (using the UNIDO approach)	1	3	15
Expert support for SSO measures/projects development (but no implementation)	2	2	15

CASO training services to industry personnel	1	3	15
CASO training services to energy practitioners	2	2	15
CASO assessment services to industrial enterprises (using the UNIDO approach)	0	4	15
Expert support for compressed-air system optimization measures/projects development	0	4	15
Other			

Q11 - How have your professional activities as IEE expert evolved in the fields of EnMS, SSO and/or CASO after attending the UNIDO Expert Trainings? What were the main reasons for this development?

Number of Respondent	Response
1.	My professional activities as IEE expert evolved rapidly after trainings. The main reason is a very good trainings and experts in EnMS, SSO and CASO.
2.	Not much has changed as Macedonia is a small limited market. There was an opportunity to continue the cooperation with the CASO project host plant for their other facilities throughout the world, but the cooperation did not happen as the interest and communication from REC was not satisfactory, and they were the critical link between the experts and the host plants.
3.	gain knowledge and gained experience during the trainings and conducted CASO project
4.	I have upgraded my professional skills in EnMS and CASO, which enabled me participation as an expert in several projects. In addition, since I am adjunct docent at University, I prepared a curriculum for the course Energy Management and Energy Efficiency (still in the process of approval)
5.	Improcvved kmnowledge in CASO better understanding systems
6.	Mostly I have more knowledge of the regression models and awareness of the ways in rational use of energy, and how to improve and measure that improvement.
7.	I have learned better how to use Excel, regression analysis of the data, how to make a plan and a project to reduce energy, how to choose materials regarding energy efficiency etc.
8.	EnMS: Partial implementation of EnMS, EEM's / CASO: Optimization in several plants
9.	I feel more confident and secure when I work in that field. The main benefit is the possibility of an adequate presentation of the results and expectations and their comparability, which will give an additional reason for the implementation and development of ENMs.
10.	to be capable for industrial sector
11.	Providig right size compressor to our customers and otimizing their equpment

12.	After the EnMS training I successfully led the certification with ISO50001 within EVN, where I was working during the trainings. The EnMS approach encouraged me to further develop my career in Project Management and energy efficiency. Now I work as a Project Manager for renewable energy sources.
13.	As an employee who attended UNIDO Expert Trainings, after the completion of them, I have allocated a small part of my working time for activities related to the subject of the trainings.
14.	They evolved towards expertise that i didnt have bevor
15.	Excellent stadium. Cooperation with other experts.
16.	I believe that my expertise has gained further quality.

Q12 - What was the most valuable aspect of the UNIDO Expert training and support for you? What did it do well?

Number of Respondent	Response
1.	The great practical experience of the experts and their support during the training and after
2.	The training increased both my theoretical and practical CASO knowledge. Was a very good opportunity to connect with engineers from the same field of expertise, some of them well known international experts. Gave me an overlook of how an UNIDO project functions. Gave me the opportunity to work and grow as an engineer. The project was very well organized. My only remark is the lack of final certification from UNIDO and the missing post training cooperation between the experts and the industry.
3.	possibility to implement gained knowledge on the field
4.	It opens the perspectives for the companies as well for the experts to identify a significant set of opportunities not only for optimization and energy management, but also for better resources management in general.
5.	Small tips and tricks which helps me to get the most value from the existing facilities. E.g. incremental change of compressors with different power, as company expands
6.	Networking
7.	All parts of the EnMS training was useful and in all parts I learned something.
8.	The most valuable aspect of the UNIDO Expert training was learning analysis data and depending of these data how to make a plan to reduce energy in some significant energy user and also reputation as e energy efficiency manager in the company.
9.	CASO- Practical use of measuring equipment, interpretation of the results, EEMs that give quick results
10.	This is the real guideline of how to implement ENMs. It is easy to follow and can delivered noticeable results.
11.	technical support to learn novelties in ENMS
12.	Tje teoretical part and big practice experince shared by traainers

13.	The UNIDO tools provided. I extensively used it for the implementation of the EnMS in the company I worked.
14.	The real case study
15.	Sharing experience.
16.	The most valuable aspect of the UNIDO Expert training and support for me was the specific approach to industrial systems optimisation. Also, the use of measurement equipment in concrete situations was a valuable experience.

Q13 - Is there any other comment or suggestion that you would like to make?

Note: Open-ended question. Maximum 500 characters (incl. blanks).

Number of Respondent	Response
1.	To continue with such trainings because they are very useful
2.	Training and program that are far beyond the expectations i had before they started.
3.	No
4.	It was perfect opportunity to learn new things and to get to know people who are in the same branch. This projects should continue in the future.
5.	No
6.	Thanks for the training!
7.	To make more training like this
8.	Repeat this excellent program as much as possible and in many countries as possible.
9.	No
10.	No
11.	No other comments