



REQUEST FOR CEO ENDORSEMENT

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

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PART I: PROJECT INFORMATION

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			
Country(ies):	Macedonia, The Former Yugoslav Republic of	GEF Project ID: ¹	4902
GEF Agency(ies):	UNIDO	GEF Agency Project ID:	120127
Other Executing Partner(s):	Ministry of Environment and Physical Planning, Ministry of Economy, Energy Agency of the Republic of Macedonia, Regional Environment Centre of Macedonia;	Submission Date:	07-03-2014
		Resubmission Date:	10-31-2014
		Resubmission Date	12-01-2014
GEF Focal Area (s):	Climate Change	Project Duration(Months)	42
Name of Parent Program (if applicable):	Not Applicable	Project Agency Fee (\$):	140,000
	<ul style="list-style-type: none"> ➤ For SFM/REDD+ <input type="checkbox"/> ➤ For SGP <input type="checkbox"/> ➤ For PPP <input type="checkbox"/> 		

A. FOCAL AREA STRATEGY FRAMEWORK²

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount (\$)	Cofinancing (\$)
CCM-2	Outcome 2.1: Appropriate policy, legal and regulatory frameworks adopted and enforced	Output 2.1: Energy efficiency policy and regulation in place Output 2.3: Energy savings achieved	GEFTF	266,000	614,000
CCM-2	Outcome 2.2: Sustainable financing and delivery mechanisms established and operational	Output 2.2: Investment mobilized Output 2.3: Energy savings achieved	GEFTF	1,134,000	5,290,628
Total Project Cost				1,400,000	5,904,628

¹Project ID number will be assigned by GEFSEC.

² Refer to the [Focal Area Results Framework and LDCF/SCCF Framework](#) when completing Table A.

B. PROJECT FRAMEWORK

Project Objective: 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.						
Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund (\$)	Grant Amount (\$)	Confirmed Co-financing (\$)
1. Strengthening Macedonian policy, regulatory and institutional frameworks and capacity for market transformation for industrial energy efficiency and green industry.	TA	Enhanced promotion and support of sustainable industrial energy efficiency by strengthened policy and regulatory frameworks and market-based mechanisms	<p>1.1 Legal requirements for large industrial and public sector energy consumers to have a certified Energy Management Practitioner developed and enacted.</p> <p>1.2 Certification Program for Energy Management Practitioner is developed and enacted.</p> <p>1.3 Financial incentives for ISO 50001 Certification are developed and enacted.</p> <p>1.4 Industrial Energy Efficiency (IEE) Best Practice Information and Dissemination Program established and operational.</p> <p>1.5 Industrial Energy Data Management Framework/Map developed.</p> <p>1.6 Assessment of Climate Technologies potential in industry carried out.</p> <p>1.7 Strengthened technical capacity of Macedonian institutions responsible for developing, implementing and monitoring industrial energy efficiency and climate change mitigation policies and programs; 25 public officials trained.</p>	GEFTF	231,000	410,000
2. Market development support for deployment and diffusion of best available practices and technologies for energy efficiency and environmental	TA	Adoption of energy and environment management systems leading to greater resource investments in energy efficiency	<p>2.1 A group of fifty (50) local energy efficiency and environment professionals are equipped with the technical expertise and tools required to:</p> <ul style="list-style-type: none"> a. implement in industry Energy Management Systems (EnMS) in line with ISO 50001 b. carry out industrial energy system optimization (ESO) assessment 	GEFTF	620,000	1,300,000

sustainability in industry		measures and low carbon technologies, and increased energy productivity and competitiveness of Macedonian industries	<p>c. train industry personnel in EnMS and energy system assessment & optimization</p> <p>d. offer EnMS, energy system assessment & optimization technical services to industry.</p> <p>2.2 Ten (10) enterprises from key Macedonian industrial sectors implement Energy Management Systems in line with ISO 50001.</p> <p>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.</p> <p>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.</p> <p>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 (EnMS and ESO).</p> <p>2.6 Personnel of fifty (50) enterprises receive training on the implementation of energy management systems and on energy system optimization measures.</p>			
3. Enhancing existing financing facilities to boost investments in energy efficiency and low carbon technologies for industry	TA	Adoption of energy efficient and low carbon process/ sector specific technologies	<p>3.1 Technical assistance facility to support IEE investments is developed and established.</p> <p>3.2 At least fifteen (15) local EE consultants trained in IEE investments preparation.</p> <p>3.3 At least ten (10) bank lending officers trained in assessing IEE investments proposals.</p>	GEFTF	120,000	134,628
	Inv		3.4 Performance-based financial reward mechanism for IEE		300,000	3,800,000

			investment projects established.			
4. Monitoring and Evaluation	TA	Not applicable	4.1 Monitoring and evaluation framework. 4.2 Mid-term-review 4.3 Independent final project evaluation.	GEFTF	24,000	40,000
				Subtotal	1,295,000	5,684,628
				Project Management Cost (PMC) ³ (select)	105,000	220,000
				Total project costs	1,400,000	5,904,628

C. SOURCES OF CONFIRMED COFINANCING FOR THE PROJECT BY SOURCE AND BY NAME (\$)

Please include letters confirming cofinancing for the project with this form

Sources of Co-financing	Name of Cofinancier (source)	Type of Cofinancing	Cofinancing Amount (\$)
GEF Agency	UNIDO	Grant	60,000
GEF Agency	UNIDO	In-kind	390,000
National Government	Ministry of Environment and Physical Planning	In-kind	150,000
National Government	Ministry of Economy	In-kind	100,000
Others	Energy Agency	In-kind	100,000
Private Sector	ARCELORMITTAL	In-kind	28,700
Private Sector	ARCELORMITTAL	Cash	20,000
Private Sector	OKTA Crude Oil Refinery	In-kind	28,700
Private Sector	OKTA Crude Oil Refinery	Cash	20,000
Private Sector	KNAUF Radika	In-kind	23,940
Private Sector	KNAUF Radika	Cash	100,000
Private Sector	JOKA	In-kind	28,980
Private Sector	JOKA	Cash	20,000
Private Sector	Best Food	In-kind	28,980
Private Sector	Best Food	Cash	20,000
Private Sector	Feni Industries	In-kind	28,980
Private Sector	Feni Industries	Cash	20,000
Private Sector	MAKSTIL	In-kind	28,980
Private Sector	MAKSTIL	Cash	20,000
Private Sector	Macedonian Bank for Development Promotion	Cash	3,800,000
Private Sector	Macedonian Bank for Development Promotion	In-kind	54,758
Bilateral Aid-Agency	USAID - TimelProekt	In-kind	550,000
Others	Faculty of Technology	In-kind	180,610
Others	REC Macedonia	In-kind	102,000
Total Co-financing			5,904,628

³PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY¹

GEF Agency	Type of Trust Fund	Focal Area	Country Name/ Global	(in \$)		
				Grant Amount (a)	Agency Fee (b) ²	Total c=a+b
Total Grant Resources				0	0	0

¹ In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

² Indicate fees related to this project.

F. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Grant Amount (\$)	Cofinancing (\$)	Project Total (\$)
International Consultants	400,000	250,000	650,000
National/Local Consultants	450,000	750,000	1,200,000

G. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT? NO

(If non-grant instruments are used, provide in Annex D an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/NPIF Trust Fund).

PART II: PROJECT JUSTIFICATION**A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF⁴****A. 1. National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e.**

NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.:

The project remains highly consistent with national priorities expressed in key Macedonian’s strategies, policies and legislation on energy, climate change mitigation and economic development, including the Energy Law (OGRM. no 16/2011), Strategy for Development of the Energy Sector until 2030 (OGRM 61/2010), Strategy for improvement of the Energy Efficiency in Republic of Macedonia until 2020 (September 2010). In the Second National Communication on Climate Change (2008) of Macedonia to the UNFCCC, energy savings and energy efficiency were identified as the priority area of intervention to offset the increasing country’s demand for energy.

Since the approval of the project PIF, Macedonia has developed its 2nd National Energy Efficiency Action Plan (NEEAP) and it has been working on the preparation of its 3rd National Communication to the UNFCCC.

The 2nd NEEAP has a strong focus on the promotion and support of energy management in three sectors: public, commercial and industry. EnMS implementation is a planned EE measures for the Public, Commercial/Building and Industry sectors. As for the Industry sector, other planned measures include promotion of system optimization for process heating systems and motor-driven systems.

The Ministry of Environment and Physical Planning (MoEPP) is currently leading the work for the preparation of the Third National Communication on Climate Change to the UNFCCC and of the third GHG emissions inventory. While the work is still ongoing, it has been reported that compared to the Second communication some improvements were possible with respect to the use of annual emission factors in the Tier 1 method and in the use of the Tier 2 method for three categories of emission sources. Despite such improvements and an increased amount of information, the availability of good disaggregated energy and other data remains a substantial constraint. Annual GHG emissions were

⁴ For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter “NA” after the respective question.

calculated using the reference approach as top-down and the sector approach as bottom-up, using the fuel consumption by sectors since disaggregated data on GHG emissions from different types of energy transformation or processing industry were/are not available yet.

A. 2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities:

The project falls under and supports the GEF-5 Climate Change Mitigation (CCM) focal area. By addressing key existing information, capacity and policy barriers for sustainable industrial energy efficiency in Macedonia the project directly contributes to and is fully aligned with the CCM Strategic Objective 2 - Promote market transformation for energy efficiency in industry and the building sector. The project would make a tangible contribution to stimulate rapid growth of the Macedonian market for energy management and energy efficiency services and products to/for industry.

A. 3. The GEF Agency's comparative advantage:

The project is consistent with UNIDO acknowledged comparative advantage for promoting energy efficiency in the industrial sector. It draws upon UNIDO's past and current experience of cooperation with Macedonian manufacturing enterprises and stakeholders as well as of implementation of environmental and resource efficiency projects.

UNIDO brings to the project its leading global experience and extensive knowledge assets (i.e. training programs, tools, methodologies, platforms, etc.) for promoting and supporting energy management systems (EnMS) and standards implementation, industrial energy system optimization, qualification programmes for EnMS practitioners, certification schemes for ISO 50001 auditors and others industrial energy efficiency policies and programmes.

A. 4. The baseline project and the problem that it seeks to address:

A.4.1 Context for Energy Management and Energy Efficiency in Macedonian industry

The industry sector is the largest energy consumer in the country, accounting for 33.95 % of final energy in Macedonia. The main energy sources are electricity and petroleum products⁵ (Fig. 1).

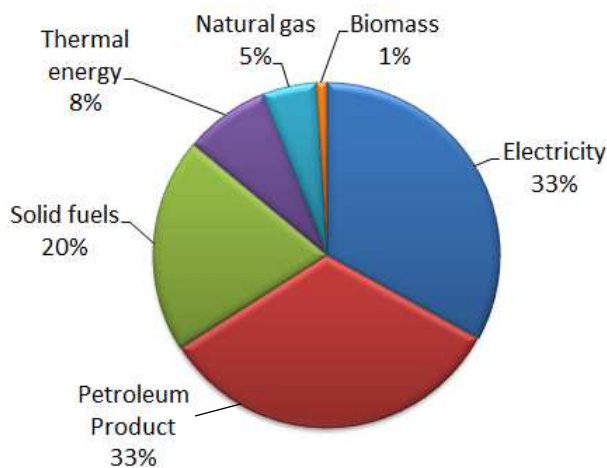


Fig. 1 – 2010 industrial energy use by energy source (Source: 2nd NEEAP)

⁵ Natural gas accounts for a relatively low share of energy consumption, however such share is expected to increase in the near future, once the development of a natural gas distribution network will be completed.

The industrial sector accounts for more than 28 percent of national GDP and engages over 30 percent of total occupied labour force. Textiles, iron and steel, cement, food and tobacco are the most important manufacturing industries of Macedonia. In 2011 four sectors (Iron and Steel; Non-metallic minerals; Food, drink & tobacco; Ore-extraction) accounted for about 90% of total industrial energy consumption (Table 1):

Table 1 Industry energy balance for 2011

	Sector Total [ktoe]	Share of total industrial energy use [%]
Iron & steel	369.0	62.1%
Non-ferrous metal	1.7	0.3%
Chemical	9.1	1.5%
Glass, pottery & building material	93.9	15.8%
Ore-extraction	33.0	5.6%
Food, drink & tobacco	40.3	6.8%
Textile, leather & clothing	12.8	2.2%
Paper and printing	2.2	0.4%
Engineering & other metal	15.4	2.6%
Other industries	17.0	2.9%

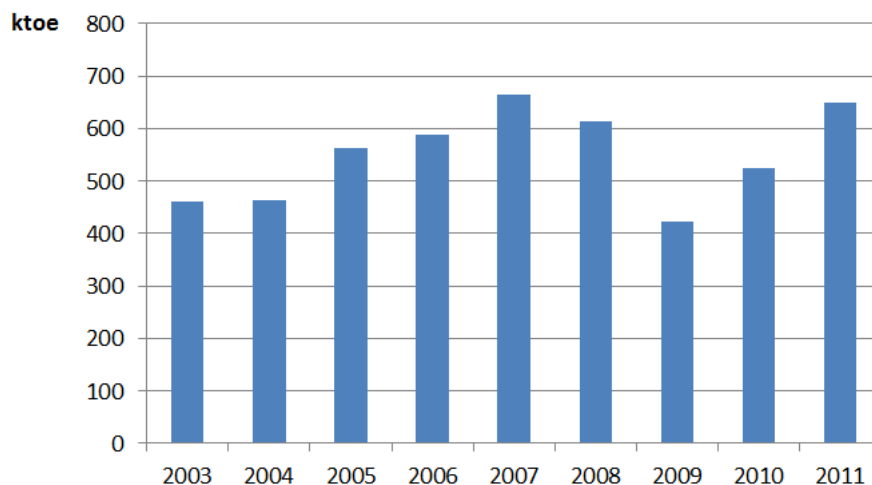


Fig. 2 – Final energy consumption in the industry sector (Source: 2nd NEEAP)

Final energy consumption in the industry sector grown fairly steadily until 2007, afterwards it declined for two consecutive years as result of global financial and economic crisis, and then started again to grow substantially in 2010 and in 2011 (Fig. 2) despite a reduction in the production of the iron & steel sector, which was compensated by increased output in ore extraction, food, drink and tobacco as well as textile, leather and clothing.

There are no clear and reliable available figures about the energy performance of Macedonian industry. According to the World Energy Council the energy intensity of Macedonian manufacturing industry in 2010 (value added at 2005 PPP) was just 2.3% higher than Europe average (0.130 versus 0.127 koe/\$05p). According with less recent reports estimates showed energy intensity 60% higher than EU 27 average. Leaving aside the fact that energy intensity is not energy efficiency and the quality and methodology used to track energy performance by Macedonian institutions remain

poor, the evidence from the work of the UNIDO National Cleaner Production (NCP) Centre in Skopje as well as of other national energy efficiency consultants is that while efficiency level differs from one sector to another and significantly between companies of the same sector, the average energy efficiency of Macedonian industry remain significantly below that of Western Europe and of few neighbouring countries. Potential energy savings identified by energy audits carried out by the UNIDO NCP Centre, by the Centre for Climate Change or reported by companies themselves through a survey carried out during the PPG phase range on average between 10% and 20%, in most of the cases without considering major technological process changes.

According to the estimates of the Strategy for Improvement of the Energy Efficiency in the Republic of Macedonia until 2020, industry is the sector with the largest potential for energy savings: 91.1 ktoe cumulated over the period 2010-2020, equal to 38% of the total industry consumption.

A.4.2 Baseline project and problems that it seeks to address at the policy and institutional level

During the last 5 plus years the Macedonian Government and its institutions have done a remarkable amount of work with regard to the development and promulgation of national strategy documents, policies, laws and sub-laws related to energy and energy efficiency. The support and technical assistance provided by multilateral and bilateral donors and agencies has played a critical role in enabling the Macedonian Government and its institutions to achieve such results (please see section A.4.5.1 for a detailed account of current policy and legal frameworks for energy efficiency, institutional landscape and ongoing technical assistance).

The work carried out in the recent past at the policy, legislative and institutional levels has been directed towards the mitigation and/or removal of problems such as:

- i. The lack of modern policy and legal frameworks for the energy markets, for the promotion of energy efficiency and renewable energy;
- ii. The very limited institutional expertise in the different energy areas and the limited capacity to develop strategies (short-, medium- and long-term), policies, laws and regulations for energy and energy efficiency in the various sectors of the Macedonian economy;
- iii. The availability of meagre resources from the national budget to work on the establishment of comprehensive policy and legal frameworks as well as on the implementation of individual policies or programmes;
- iv. The insufficient coherence of actions and coordination between the Government institutions working or involved in energy, energy efficiency and renewable energy;
- v. The poor level of expertise and capacity within the public sector, including and especially in municipalities, to operationalize energy efficiency policies and laws, and develop and implement programmes.

Despite the progress made, substantial work remains to be done in order to fully address above mentioned problems, especially as they pertain to the field of energy efficiency in industry where almost no work has been carried out. The work of the Government and its institutions has been so far entirely focused on the transposition of EU Directives and the formulation of laws and regulations to meet the Energy Community Treaty obligations. Very limited attention has been paid so far to policy implementation support through programmes and actions.

The Energy Department of the Ministry of Economy and the Energy Agency have certainly strengthened their internal capacity, but with a focus on the energy sector supply side and to a lesser extent on energy efficiency in buildings. Technical expertise and staff resources within the Energy Department for the development and/or implementation of policies, regulations and programmes for industrial energy efficiency are basically not available and only limitedly available in the Energy Agency. Such knowledge and capacity gaps with regard to IEE is clearly evident in most of the key energy and energy efficiency strategy, policy and legal documents, where industry, the largest energy consuming sector of the country, received only little attention.

A.4.3 Baseline project and problems that it seeks to address at the industrial energy efficiency market level

During the last few years there has been clearly a change in the attitude and attention of enterprises towards energy costs, primarily as result of the progressive removal of subsidies and consequent increase of tariffs. As of March 2014, within the industrial sector, electricity tariffs are now costs-reflective and subsidies have been completely removed⁶.

An important development during the last year has been the entry into force (1 January 2014) of an article of the Energy Law (Official Gazette no.16/2011 and 136/2011) which extends to about 140 companies⁷ the possibility to negotiate their electricity purchase agreements with Energy Market Operators (EMOs). At the same time, electricity companies and traders (i.e. Energy Market Operators) are now allowed to submit offers to companies/consumers and bids to electricity producers. The opening up of this electricity balancing market has the intention to achieve improved loading factor and efficiency of the Macedonian power grid in the most cost effective manner while also offering to industrial users an opportunity to reduce their electricity and power costs.

However, in order to be able to participate in the electricity balancing market and save money, industrial companies will have to be able to predict and control with high degree of precision their short-term (hourly, daily, weekly) and long-term (monthly and yearly) consumption. Otherwise the result for companies participating will be an increase of their electricity bills, rather than a reduction, due to the penalties to pay because of the discrepancies between predicted/agreed and actual electricity and power consumption.

Now, the reality is that very few companies are currently able to develop both short and long-term energy and power demand forecasts, and have the energy management capacity/control and understanding required to meet the forecasts and to avoid the payment of onerous penalties.

Despite improvements in the recent past, the majority of industrial enterprises and top management has still very limited knowledge and understanding of what is technically feasible with respect to EE in their factories; what is commercially available in terms of best-available practice and technologies; and what the financial and economic benefits that EE can deliver are.

The vast majority of enterprises are unable to properly assess their own energy performance, understand their energy costs and get a sense of their potential for cost savings and efficiency and productivity gains. This is due to insufficient technical capacity of staff, inadequate energy data monitoring and analysis practices, lack of publicly available information that can help in identifying EE improvement opportunities and sizing their potential costs and benefits.

The availability in the Macedonian's market of highly-qualified expertise and quality services for energy efficiency in industry is still limited, in terms of both number of suitable providers and range of technology options. Due to its novelty for the Macedonian market, the implementation of energy management systems (in line with ISO 50001) is definitely an area where quality and experienced consultancy services are completely lacking.

Quality of expertise and competencies of EE professionals has been clearly recognized by the Government as a serious tangible risk for the success of its EE policies and programmes, as it shows the certification and training program for energy auditors that has been developed and established during the last one and a half year by the Ministry of Economy and the Energy Agency with the critical support of USAID's and other donors' technical assistance. It is to mention that the energy auditor certification programme is primarily focused on energy auditing of buildings.

Last but not least, the mind-set and approach to industrial EE of almost all market players, first and foremost enterprises, is largely that of "the single stand-alone project approach" and "the energy champion approach". While these approaches can certainly deliver energy savings and performance improvements, they largely fail to sustain

⁶Unlikely electricity, the price of oil, natural gas and heavy fuel-oil does not differentiate between industry, residential, etc. Since 2010 the prices of oil, natural gas and heavy fuel-oil are strongly correlated with the international market prices.

⁷ All companies that have more than 10 million EURO turnover per year and more than 50 employees

improvements over time because lack of structure and vision; they introduce an unnecessary and very often detrimental focus/idea on the need for extraordinary capital investments and associated need for financing; they expose enterprises to the risk of an excessive dependence on one individual (i.e. knowledge is not really with the organization/enterprise). In other words, in the vast majority of the cases they are insufficient to determine the business and management culture change necessary to secure real sustainable and continual improving energy efficiency and performance over time.

The draft Second National Energy Efficiency Action Plan (NEEAP) has a strong focus on the promotion and support of energy management in three economy sectors: public, commercial and industry. EnMS implementation is a planned EE measures for the Public, Commercial/Building and Industry sectors. As for the Industry sector, other planned measures include promotion of system optimization for process heating systems and motor-driven systems. However, there is basically no Government led or funded programs or initiatives to support improved energy efficiency in industry, neither for the demand side (i.e. manufacturing enterprises) nor for the supply side (EE services and technology providers) of the local market for industrial energy efficiency.

Ongoing internationally supported projects are providing the only and critical contribution to fill such gap through training, methodologies, demonstrations and awareness raising aimed to building/strengthening capacity of national IEE service providers and product suppliers; generating EE and low carbon investment success stories; building enterprises' knowledge, decision-making ability and confidence in investing in energy management, energy efficiency and low carbon technologies. However, such ongoing efforts are bound to fall short in meeting the needs for a significant acceleration of industrial energy efficiency improvements, investments and market growth (please see section A.4.5.2 for a detailed account of current ongoing technical assistance projects tackling barriers to industrial energy efficiency at the market level).

A.4.4 Baseline project and problems that it seeks to address at the IEE investment and financing level

Most of the financing facilities for industrial energy efficiency investments in Macedonia are currently provided by international financing institutions (IFIs), and are available either as on-lending loans accessed through local commercial banks or as direct loans. In most cases the primary target borrower is industry and SMEs in particular.

As result of the deregulation in progress in the energy sector and the rise in demand induced by IFIs' financing facilities, some Macedonia local banks (predominantly those owned by international foreign banks such as Sparkasse Bank, Ohridska Banka, Pro Credit Bank) have started to offer own credit products aimed to finance investments in energy efficiency, renewable energy generation and cleaner production equipment.

The on-lending and direct financing facilities established by the IFIs have tried to tackle the problem of a major untapped financial and economic potential in the industrial sector for energy efficiency and technology upgrade investments by addressing some of the underlying barriers such as:

- i. The low attention to EE benefits and opportunities of industrial companies' top management when looking at their investments planning and decisions;
- ii. The lack of capabilities of the local banking and financing sector in lending for energy efficiency projects;
- iii. The higher-risk perception of the local banking sector towards non-traditional lending activities/products such as energy efficiency investments due to lack of knowledge and inability to properly appraise EE projects, including how to analyze and value the "cash flow" that an EE project would generate;
- iv. The transaction-costs associated with the promotion and development of new investments/projects portfolios and products;
- v. The lack of capacity of industrial companies to identify and develop bankable EE projects;

The analysis of the various financing facilities shows that IFIs have used different instruments ranging from the provision of more attractive loan terms (lower and/or fixed interest rates; longer loan tenures; grace periods) to the provision of free or cost-shared technical assistance for project/investment preparation, to the provision of cash

premiums (i.e. reduction of loan principal) upon achievement of agreed energy savings and other performance targets; instruments that were also differently mixed within the various facilities.

The financing facilities most successful in attracting companies' attention towards EE investments were those offering the more beneficial package of "incentives" such as the EBRD Western Balkans Sustainable Energy Financing Facility (WeBSEFF), which provided/s for cost-free technical assistance and for project performance based cash-premiums.

These financing facilities have certainly achieved good results and impact in stimulating more investments in EE by industrial companies, in increasing use of external credit opportunities rather than own resources when financially convenient, in strengthening capacity of local EE consultants in preparing IEE investment proposals, and in building capacity of some local banks and reducing transaction costs for new projects portfolios and products offers.

However, problems are far from being solved since:

- i. Most of the local banks have not been exposed, or only to a limited extent, to training about IEE and IEE projects appraisal, hence the incremental risk perception remains high.
- ii. Access to and use of EE dedicated financing facilities was possible so far only for a limited number of local banks (6 out of 18).
- iii. Likewise, the majority of local IEE consultants have still insufficient expertise and skills to prepare good-quality investment proposals that meet IFIs and local banks requirements.
- iv. The number of enterprises that could get loans from the EE dedicated financing facilities or directly from the IFIs was also limited as result of either:
 - a. Limited capacity of enterprises (due to either lack of financial resources or expertise) to accomplish the first step of showing projects' expected impact and eligibility, or
 - b. Inability of enterprises to meet IFIs and/or local banks financial/risk requirements⁸.

Capital and financing sources for IEE investments are not scarce in Macedonia thanks to IFIs' financing facilities as well as to the Macedonia banking sector's own resources (non-invested cash and cash equivalents reserve are estimated in excess of 1 billion Euros). What local commercial banks claim as major barrier to more IEE investments is that "*in Macedonia there is limited number of good projects and good companies to be financed*" (please see section A.4.5.3 for a detailed account of current ongoing IFI financing facilities for or open to industrial energy efficiency investments)

A.4.5 Additional information about the Baseline projects and problems that it seeks to address

A.4.5.1 Policy, regulatory and institutional frameworks for IEE

The Republic of Macedonia is a Contracting Party of the Energy Community Treaty since 2006. As such the Republic of Macedonia has the obligation to adopt and implement the European Union *acquis communautaire* on energy, environment, competition, energy efficiency and renewable energy. Since 2006 substantial policy reforms and legislative work has been carried out to align the Macedonian's policy and legal frameworks for the energy sector and markets to those of the EU and its related Directives. As for the *acquis communautaire* on energy efficiency, work has focused on the transposition of the various Eco-design Directives and the Directive 2006/32/EC on Energy End-Use Efficiency and Energy Services and relevant obligations.

⁸ It is to mention though that there is significant difference between stringency of IFIs financial due diligence and the due diligence of local commercial banks, which while still representing a challenge for many SMEs and large companies, it is less demanding than that of IFIs.

Within the scope of the work for the Directive 2006/32/EC efforts have concentrated on the promulgation of new regulations (i.e. Rulebooks), the development of National Energy Efficiency Action Plans (NEEAPs), the support to their implementation and the monitoring and reporting of their achievements (i.e. energy savings). At the same time a number of strategy documents have been also developed to provide an overarching vision and guidance for the medium- and long-term development of Macedonia in the area of energy and energy efficiency. Table 2 below provides the list of the key policy and strategy documents for or related to EE. Table 3 provides the list of the key laws and regulations documents for or related to EE.

Table 2 – Policy framework for or related to EE

<p>National Strategy for Sustainable Development, 12 January 2010</p> <p>This Strategy provides a framework and practical guidelines for the public and private sectors on how to plan and implement sustainable development and to encourage greater domestic and foreign investments.</p>
<p>Strategy for Energy Development in the Rep. of Macedonia until 2030 (Official Gazette 61/2010, May 3, 2010)</p> <p>This Strategy provides overarching principles and guidance for policies and programs to be developed and implemented in the fields of energy: access to stable and continuous energy supply (essential for economic development and social stability); enhanced security of supply; improvement of environmental situation; development of market competition and better exploitation of economies of scale.</p>
<p>Strategy for Improvement of Energy Efficiency in the Rep. of Macedonia until 2020(Official Gazette 143/2010, October 29, 2010)</p> <p>This Strategy provides the overarching guidance for policies and programs to be developed and implemented in the fields of energy efficiency. The objective of the Strategy is to advance market transformation in the field of EE by creating a policy framework that will stimulate demand for more energy-efficient technologies and services. As demand grows, the Strategy envisages the proliferation of both Energy Service Companies (ESCOs) and companies that supply energy-efficient equipment and maintenance services for the above.</p>
<p>First National Energy Efficiency Action Plan, 05 April 2011.</p> <p>The First NEEAP was developed to cover a period of 9 years, from 2010 to 2018, and it set out measures and activities aimed to attain by 2018 an overall national reduction of primary energy consumption of at least 9% compared to the average registered in the period 2002-2006, and it also set national indicative intermediate target for energy savings to at least 4% for a period 2010-2012. The overall national energy saving target until 2012 was set in 66 ktoe, of which 41 ktoe were expected to be achieved in industry. Based on an analysis of achieved energy savings using available statistical data, it was determined that in 2012 the planned objectives/targets were not achieved. The results based on the Bottom-Up method showed savings of 23 ktoe and of 43 ktoe with Top-Down method.</p>
<p>Program for Implementation of the National Energy Strategy, Official Gazette 50, April 3, 2013</p> <p>This Program determines the measures, conditions, means and dynamics for implementing the National Energy Strategy, as well as the necessary financing and the sources for securing it. This Program does not include energy efficiency in industry but it is rather oriented towards energy efficiency in the public, residential and service sectors. The sources of financing are based mostly on IFIs and the state-run electricity producer ELEM.</p>
<p>Draft National Program for Energy Efficiency in Public Buildings in the Republic of Macedonia until 2019 (Phase 1), February 2013 (Still under development and consideration)</p> <p>Even though the NPEEPB does not target the industrial sector as such, it does propose the creation of an EE fund geared towards the public sector. Should this revolving Fund prove successful, it will be extended to other sectors, including industry. Unfortunately, the NPEEPB does not earmark any funds for the implementation of this extended fund, but identifies potential sources of funding in IFIs such as the World Bank, IFC, EBRD, EIB and the IPA.</p>

Draft Second National Energy Efficiency Action Plan

The Second NEEAP covers the period 2013-2015. The highest priority indicated in the Draft Second NEEAP of Macedonia is the urgent need to implement an efficient information gathering system for monitoring and verifying energy savings associated with the implementation of the EE measures set out in the Second NEEAP.

Besides that, the Draft Second NEEAP has a strong focus on the promotion and support of energy management in three economy sectors: public, commercial and industry. EnMS implementation is a planned EE measures for the Public, Commercial/Building and Industry sectors (P.2, C.2, I.2). As for the Industry sector, other planned measures include promotion of system optimization for process heating systems and motor-driven systems (I.1 and I.3).

According to the Second NEEAP a network of industrial companies will be developed to accelerate and promote the adoption of energy management systems and energy efficiency measures. The network will aim to connect industrial companies with groups of experts and other national relevant organizations to speed up the process of adopting best available energy-efficient technologies and practices. The process would/will commence with the implementation of ISO 50001 Energy Management System standard in industrial processes. This program is envisaged to be facilitated by the Ministry of Economy with the Macedonian Chamber of Commerce as “national executive coordinator”.

Table 3 – Legal framework for or related to EE

Energy Law, Official Gazette 16/2011, February 22, 2011; Amendment, Official Gazette 136/2011, October 10, 2011, Amendment 79, May 31, 2013.

The Energy Law governs: (1) the energy policy objectives and its enforcement; (2) energy activities and manner of energy activities regulation; (3) construction of energy facilities; (4) the status and competences of the Energy Regulatory Commission of the Republic of Macedonia, (5) the electricity market; natural gas market; crude oil, oil derivatives and fuels for transport market; and heating energy market; (6) the energy efficiency requirements and promotion of the use of energy from renewable sources; and (7) other issues of importance in the energy field. The law underwent two subsequent amendments in 2011 and 2013 respectively: the first Amendment was mostly concerned with the decision making deadlines within the Energy Regulatory Commission, whereas the second Amendment enabled the adoption of the Rulebooks on Energy Performance of Buildings and the Rulebook on Energy Audits.

Rulebooks on Energy Performance of Buildings and Energy Audits

The Rulebook on Energy Performance of Buildings and the Rulebook on Energy auditing codify new energy efficiency practices into Macedonian legislation, such as:

- Certificates of energy performance;
- Licenses for energy auditors;
- Authorized energy auditing firms;

These Rulebooks define the conditions and standards for the construction of private and public buildings, which will allow for classification according to the degree of energy efficiency and the issuing of respective “energy passports”. Licensed and specially trained energy auditors will oversee the implementation of these Rulebooks. The training of future auditors will be undertaken by the Energy Agency.

Law on Environment and Integrated Pollution Prevention and Control Rulebook

The EU Integrated Prevention and Pollution Control (IPPC) Directive is mainly transposed in Chapter XII of the

Macedonian Law on Environment which regulates the issuing of environmental integrated permits (IPPC permits) for the operation of certain installations. Parts of the IPPC Directive were transposed into the secondary legislation. The Law of Environment mandates both for the Ministry of Environment and Physical Planning and the Macedonian Government to regulate certain issues through secondary legislation.

The Law on Environment envisages issuing of A and B IPPC Permits, in regards of the activities and the capacity of the installations. The activities of the installations for which a certain permit should be issued are defined in the Decree on determining the installations for which IPPC Permit should be issued and time schedule for submission of the Adjustment Plans (Official Gazette of RM 89/05). The installations for which a B-IPPC Permit is issued are listed in the same Decree and the issuance of the B-IPPC Permits is a competence of the local authorities. Issuing A-IPPC Permits, as well as B-IPPC Permits for installations situated in protected areas, is a competence of the Ministry of Environment and Physical Planning.

It is important to mention that in accordance with the procedure for issuing an A-IPPC permit and A-Adjustment IPPC permit, an essential part of the permit is the preparation of a special chapter on energy (part 2.7). Operators of the installations are requested to develop “*Plan for Energy Management*”, which needs to be updated annually. In the case of the A-IPPC permit, operators of installations need also to follow “*BAT for basic energy conditions, BAT on basic energy consumption and BAT on further conditions on energy savings*”. Progress is monitored through the annual reports which are submitted by operators to the IPPC department. However, at the moment there is no template on the form and content of such plan for energy management, including energy indicators, and no energy management expertise within the IPPC department to review energy actions, validate and verify submitted plans for energy management.

MoEPP’s efforts in the recent past have been focusing on building the institutional capacity, and in particular that for inspections and monitoring, for validating and verifying adjustment plans and compliance with the IPPC Reference Document on Best Available Techniques (BREF) for those sectors for which A and B IPPC Permits are to be issued in Macedonia, i.e. Energy Industries, Production and Processing of metals, Mineral Industry, Chemical Industry, Waste Management. In this regard it is to mention that with the exception of sector BREFs developed after 2010-2011, other sector BREFs are focused on improving specific technological processes through optimal operations and new technologies and techniques, and there is no meaningful guidance and/or requirements for cross-cutting energy efficiency best-available techniques (BAT) such as energy management and auxiliary energy systems optimization⁹.

Rulebook on Energy Balances and Energy Statistics, Official Gazette 138/2011, October 5, 2010

The Rulebook stipulates the content of the Energy Balance; the content, manner and deadline for submission of the data necessary for preparation and surveillance of the realization of the energy balances; the organs of the state administration and the units of the local self-government, holders of licenses for execution of energy activities, as well as the consumers of energy or fuels from which is requested to submit data, as well as the deadlines for submission of the data; the content, manner and deadline for submission of data necessary for preparation of the Energy Strategy and for preparation and monitoring of the progress of the Program for implementation of the Strategy.

The Ministry of Economy and the Energy Agency are the institutions with the delegated authority and the responsibility to drive the data collection process and prepare the Energy Balance.

Rulebook for price-setting of electricity for captive consumers, Official Gazette 21/2011, February 21, 2011

This Rulebook determines the means and conditions for forming, approving and controlling of prices enabling the

⁹Acknowledging the gap, in 2009 the European Commission formally adopted a Reference Document on Best Available Techniques for Energy Efficiency. This document contains guidance and conclusions on techniques for energy efficiency that are considered to be compatible with BAT in a generic sense for all installations covered by the IPPC Directive, but this BREF is not part of the IPPC Directive requirements.

regulated maximum revenue needed for performing the following regulated activities:

- i. The production of electricity to satisfy the demand of captive consumers and provide systemic services, operational reserves and balancing energy for the needs of the transmission operator within the framework of the production units.
- ii. Providing electricity to captive consumers

Instruction for implementation of energy efficiency measures and other measures for energy savings in the determination of the characteristics of products and services that are subject to public procurement

This Instruction provides assistance to the contracting parties to take into account energy efficiency during the public procurement process and when determining procurement decisions aiming to:

- i. Fulfil the requirements set forth by the Government and all public bodies, in accordance with Article 5 from the Directive 2006/32/EC on energy end-use efficiency and energy services
- ii. Assist in conducting the public procurement process in accordance with Directive 2006/32/EC
- iii. Decrease CO₂ emissions, and
- iv. Assist in the rational expenditures of the state budget.

Products and services under this Instruction are the following:

- i. Energy management
- ii. Boiler plants
- iii. Space and water heating
- iv. Ventilation and air-conditioning
- v. Lighting
- vi. Building materials
- vii. Water
- viii. Maintenance
- ix. Office/IT equipment

Ordinance on the indicative targets for energy savings, Official Gazette 112/2011, August 24, 2011

This ordinance sets the indicative targets for energy savings by 2018 by sectors. These savings relate to the final energy consumption and are based on the Strategy for Improvement of Energy Efficiency. The interim indicative savings target set for 2012 was 4.04% compared to the average annual final energy consumption for the period 2002-2006, or 66.1 ktoe. By sectors the interim indicative saving targets set were: Industry – 41.0 ktoe; Transport – 12.5 ktoe; Households – 7.6 ktoe; and Commercial and service sectors – 5.0 ktoe.

Ordinance for the eco-design of products

This ordinance regulates in further detail:

- i. The general specifications for the eco-design of energy-consuming products or products that affect energy consumption;
- ii. The methods by which the generic and specific requirements for eco-design are determined;
- iii. The generic and specific requirements for the eco-design of particular types of products or product groups which utilize energy or affect energy consumption;
- iv. Internal quality control of the eco-design;
- v. The system for determining and managing the control of compliance with regulations for eco-design;
- vi. The dynamics and end-dates for the application of the conditions and requirements for particular types of products which utilize energy or affect energy consumption and,
- vii. Other conditions that need to be fulfilled in order to ensure that energy-utilizing products and products which affect energy consumption fulfil the requirements for eco-design.

The purpose of this ordinance is to:

- i. Facilitate the free circulation of products on the market of the Republic of Macedonia;
- ii. Contribute to the promotion of sustainable development through the improvement of energy efficiency and the enhancement of environmental protection, and
- iii. Improve energy security.

Products that are covered by the measures stipulated in this ordinance can be marketed and/or utilized only if and when they are in accordance with the requirements set forth in those measures and are marked with a CE marker in accordance with Article 7 of this ordinance.

Liberalization of the Electricity Market

The Law on Energy, according to Art. 197, calls for regulating the liberalization of the electricity market. To create an enabling environment a number of bylaws have been promulgated in 2012, covering the following issues: Rules for the electricity market; Rules for electricity supply; Rules for last instance electricity supply; Price list for last instance electricity suppliers; Tariffs for transmission and distribution of electricity and for the services provided by the electricity market operators.

In line with the Law on Energy and corresponding bylaws, qualified electricity consumers¹⁰ will be free to buy electricity¹¹ based on plans of their short – term (hourly, daily, weekly) energy consumption, as well as, the long-term (monthly and yearly) consumption. In case of discrepancies between the predicted and traded values and the real-time values of the energy spent the Company will pay penalties into the system. The deadline for the market liberalization startup was set on 01.07.2013. The market was not ready and therefore the Regulatory Committee adopted in 2013 an Action Plan for the liberalization of the electricity market in order to revise the relevant bylaws by setting new deadlines for all participants and to address other outstanding issues that prevented the market liberalization on time.

The new deadline for qualified consumers was set on 01.04.2014. In March 2014 all the qualified consumers registered themselves in line with the Rules of the electricity market and concluded contracts with electricity suppliers. Approximately 120 qualified consumers already purchase electricity from EVN Supply while the others from the Energy Delivery Solutions.

The Department of Energy (DoE) within the Ministry of Economy (MoE) oversees the entire energy sector, both supply and demand side, and it is in charge of all energy efficiency-related issues from a policy- and law-making perspective. The work carried out over the last years has essentially focused on the energy supply market and end-use in the public and building sectors. The Department of Energy of the Ministry of Economy represents Macedonia within the Energy Community and it has the ultimate responsibility for Macedonia's fulfillment of the Energy Community Treaty's obligations, including the development, implementation, monitoring and reporting of the NEEAP. The Department of Energy does not have any technical expertise or staff in the field of industrial energy efficiency.

The Department of Industry Policy (DoIP) within the Ministry of Economy is responsible for the development of policies, legislation and programmes aimed to support enhanced competitiveness, innovation and quality of the Macedonian industrial/manufacturing sector. The Industrial department has implemented in the past incentive programmes to promote the adoption of international management systems standards such as ISO 9001 and ISO 14001.

¹⁰ All companies that have above 10 million Euro profit per year and have over 50 employees are qualified to buy electricity on the free market. There were 146 qualified consumers in 2013 and 222 in 2014; each year the list of qualified consumers is updated by the Central Registry.

¹¹ The trade is based on two parameters: power (measured in MW) and electricity consumption.

The Energy Agency of the Republic of Macedonia (EARM) has the mission to support the realization of the Government energy policy through the preparation of strategies, the development and implementation of plans, regulation and programs with special emphasis of energy efficiency (EE) and usage of renewable energy sources (RES). During the last few years the Energy Agency has been appointed an increasing number of tasks and responsibilities related to the promotion of EE and RES; prepare proposals for new laws, regulations and technical standards; prepare EE and RES studies, monitor and report on Macedonia NEEAP and energy policy implementation. The Energy Agency has been appointed as institution responsible to develop and establish the certification/licensing programme for energy auditors.

The Ministry of Environment and Physical Planning (MoEPP) is responsible for the development and implementation of policies, legislation and regulations in the field of environment management, pollution prevention and control, climate change and physical planning. The Ministry of Environment is also responsible for ensuring that Macedonia meets the requirements and fulfils the duties set forth by different international environmental agreements that the country has subscribed, including the Kyoto Protocol. The MoEPP oversees the enforcement of the National IPPC scheme through its State Environmental Inspectorate (SEI). With the financial and technical support of the Government of Norway the MoEPP has initiated foundation preparatory work for future participation of Macedonian enterprises in the EU Emission Trading Scheme (EU ETS). The MoEPP has been recently appointed by the Government as the National Designated Entity for the UNFCCC Climate Technology Centre and Network (CTCN). In such new capacity the MoEPP is taking steps to use opportunities offered by the CTCN to enhance the Ministry and the Government work and initiatives towards the promotion of climate and clean-energy technology transfer, especially in the industrial and commercial sectors. It is to mention that no assessment of technology upgrade opportunities for the manufacturing sector has been carried out so far. In 2005 a National Capacity Need Assessment for Global Environmental Management was carried out together with an Evaluation of Technology Needs for GHG Abatement in the Energy Sector. Both exercises highlighted a significant gap in terms of performance, capabilities and modern technologies which led to indicate technology transfer has a key area for work and international assistance.

A.4.5.2 Policy, regulatory and institutional ongoing relevant projects

With the signing of the Energy Community Treaty in 2006 and before that the submission of its EU membership application (2004), the Republic of Macedonia committed to ambitious and challenging goals, especially for its institutions, constrained by very limited expertise in many of the Energy Community Treaty working areas and by meager national financial resources. Recognizing such constraints many bilateral and multilateral donors have contributed over years substantial technical assistance to the Macedonian Government and its institutions to help in moving forward with the development of policies, legislation, regulation and programmes while building and strengthening institutional expertise and capacity. Table 4 below provides a snapshot of key technical assistance programmes relevant to IEE and/or the scope of the GEF-UNIDO project that have been implemented in the last 5 years (recently completed or ongoing) or that are under preparation.

Table 4 – Policy and Institutional technical assistance projects for or related to EE

The Green Growth Program

Funded by the World Bank and the Governments of Norway and Sweden the Green Growth Program is a wide-scale effort that includes studies, analyses, technical assistance and training aimed to inform and support the Republic of Macedonia in the pursuit of achieving long-term economic growth and simultaneously reducing its contribution to climate change. The Program comprises of two components: 1) Analysis and Modeling, wherein it assesses the role of key sectors in a green growth strategy (namely energy, agriculture, water, transport and urban spaces); 2) Technical assistance, wherein it provides advisory services to the Government and its agencies based on the results of analyses and modeling carried out.

Instrument for Pre-Accession Assistance (IPA) Project on EE

If on one hand the Energy Community Treaty imposes obligations to the Republic of Macedonia, on the other it provides also assistance through EU funding. The Ministry of Finance and the Ministry of Economy are the recipient of substantial budgetary and TA support from the EU. Currently (2nd quarter 2014) they are evaluating proposals for an IPA Project aimed at increasing the capacities of the Energy Department within the Ministry of Economy and of the Energy Agency. The project has a focus on strengthening institutional capacities for a more competitive energy market and for more streamlined and effective adoption and implementation of EU legislation in the area of energy, energy efficiency and renewable energy. The current IPA project for EE is covering the period 2014-2016, but early discussion about the IPA project/funding for the period 2016-2018 between the Macedonian Government and the European Commission (EC) Delegation in Skopje has already started.

EU Emission Trading Scheme Implementation– Preparatory phase project

The Ministry of Environment and Physical Planning in cooperation with the Norwegian Government is implementing this project as a preparatory phase leading up to future implementation of the EU Emission Trading Scheme (ETS) in Macedonia. The project aims to build enabling conditions for the implementation of the EU ETS in the country. It provides support to the process of building local capacities through a series of sector-specific trainings (those identified as potential EU-ETS installations) and through the preparation of draft legislative acts to supplement and amend the Law on Environment and bylaws of the future Law on Climate Action.

USAID Low Emissions Development and Clean Energy Investment (LED-CEI) Project

The LED –CEI Project builds upon and expands the substantial past and ongoing USAID technical assistance provided to develop energy laws and the legal framework to comply with EU directives and Energy Community Treaty as well as to prepare strategies and action plans for developing renewable energy and energy efficiency technologies. The LED-CEI Project is supporting the Government of Macedonia's efforts in implementing relevant strategies and action plans. Project activities are focused under three main objectives: 1) Streamline RE project development and investment processes by improving the enabling environment; 2) Establish low emissions development planning processes; 3) Donor coordination. Under objective 2) the LED-CEI project has been providing assistance for streamlining processes of data collection and sharing for preparing the country Energy Balance and GHG Inventory; preparing the Second National Energy Efficiency Action Plan; finalizing the legal framework on energy efficiency in buildings; and assisting the Energy Agency in developing the training curriculum on energy audits.

GIZ Monitoring and Verification Platform

Macedonia is part of the regional project “Monitoring and Verification Platform” sponsored by the GIZ Open Regional Fund supporting Energy Efficiency. Other participating countries are Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro and Serbia. The project provides, within the scope of its Phase I, methodologies for energy savings: a Top Down methodology (TD) and Bottom-Up methodology (BU). During Phase II a Monitoring and Verification Platform (MVP) is being developed as a web tool. Each project phase has included a training cycle for relevant stakeholders such as national energy agencies, national Bureaus/Offices of Statistics and relevant experts. For 2014 activities planned include testing of the MVP, training for national, regional and local stakeholders (depending on the country context) and start-up of data entry by each country.

GEF Sustainable Energy Project

The Project, implemented by the World Bank, assisted the Macedonian Government and institutions in developing enabling framework, institutional capacity and financing mechanisms to promote and support sustainable markets for energy efficiency and renewable energy. The Project consisted of three components: 1) technical assistance for preparation of energy audits of buildings and technical documentation for EE retrofits, and development of strategic documents (National Program for EE in Public Buildings, Energy Strategy Implementation Program, Wind Power

Integration Study and Wind power potential assessment); 2) Financial support for EE retrofits in buildings, including grants and co-financing; 3) Credit line for private sector RE/ EE projects through the MBDP and several commercial banks.

Enabling the Environment for Introducing Energy Efficiency in Buildings in the Republic of Macedonia

Funded by the Austrian Development Cooperation this project consist of five components: 1) Capacity building; 2) Legislative and enabling environment; 3) Pilot projects; 4) Know-how exchange between Academic Institutions; and 5) Awareness raising campaigns. The project is currently on hold due to the need to review and update specific objectives and activities.

A.4.5.3 Survey on Energy Management and Energy Efficiency in Macedonian industry

Within the scope of the survey carried out during the PPG phase, information about energy management and energy efficiency practices were collected from 21 enterprises. None of the survey respondents had in place an energy management system. Fig. 3 and 4 provide snapshots of the average age of process technologies and auxiliary energy systems (compressed-air systems, steam systems, pumps systems, etc.). For this group of surveyed enterprises, a mix of medium-sized and large companies, process technology is on average less outdated than auxiliary energy systems. Looking at the disaggregated data for each auxiliary energy system, shows that 31% of the electric motors systems, 40% of the compressed-air systems and 20% of the steam systems have more than 15 years (68%, 66% and 58% respectively have more than 10 years). These numbers confirm the priority of and potential for energy savings in industrial energy auxiliary systems set out in the draft 2nd NEEAP.

Average age of Process Technology

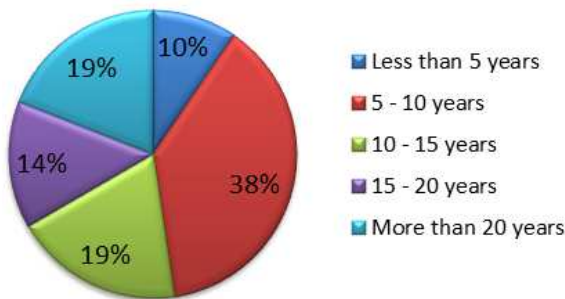


Fig. 3 – Average age of process technology

Average age of Auxiliary Energy Systems

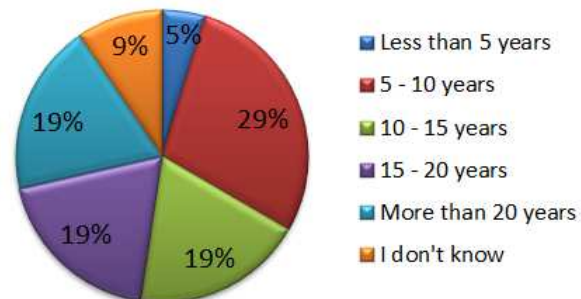


Fig. 4 – Average age of auxiliary energy system

A.4.5.4 Industry energy efficiency ongoing relevant projects

Table 5 provides a summary of the ongoing donor funded technical assistance projects that aim to make an impact on the Macedonian market for industrial energy efficiency services and on companies’ energy efficiency practices, resource allocation and investment decisions.

Table 5 –Technical assistance projects for or related to EnMS or IEE practices and market

USAID Industrial Energy Management Project

The USAID Industrial Energy Management (IEM) Project is part of the USAID’s country programme to support competitiveness of Macedonian industry.

The IEM Project has a focus on SMEs and it aims to:

- i. Pilot the use of hardware- and software-based systems to measure, monitor and help managing energy consumption, in particular electricity, in a limited number of partner companies (15-20)
- ii. Provide technical assistance, training and subsidies to partner companies for the design, installation and start-up operations(i.e. troubleshooting) of the hardware- and software-based energy measuring and monitoring systems
- iii. Promote and raise awareness about the principles of ISO 50001 as overarching framework and methodology for sustainable energy management
- iv. Build capacity of local suppliers of relevant hardware- and software-based products to offer similar energy monitoring and management support packages
- v. Provide technical assistance to partner companies in the development of specific EE investment opportunities and in their submission to local commercial banks and financing institutions
- vi. Raise awareness of and provide training to lending officers of local banks about the assessment of energy efficiency projects/investments, including the hardware- and software-based systems
- vii. Promotes pilot results to a broader audience of industrial enterprises management and managers

Launched at the end of 2012, the activities of the USAID IEM Project have been shaped taking into account the forthcoming, at that time, opening up to all Macedonian medium-sized companies of the electricity market balancing system; for this reason the main focus on the piloting and promotion of hardware- and software-based systems to measure, monitor and help managing energy consumption. While ISO 50001 and energy management systems are part of the project, the level of resources and depth of efforts allocated to building partner companies' understanding of and capacity for ISO 50001 energy management systems implementation is lower than that for the work on the hardware- and software-based systems and on the EE investments support.

UNIDO Low Carbon Production in the Agro-Industry Project

The Project's objective is to support sustainable development in the agro-industry in Macedonia through low carbon production. The Project pursues the objective through the promotion and support of resource efficiency and cleaner production (RECP) practices and technologies, including energy efficiency and renewable energy technologies.

Project's activities consist of:

- i. Development of methodology and approaches for RECP;
- ii. Training of national service providers;
- iii. Implementation of RECP assessments (including water, energy and materials) and subsequent low carbon production assessments;
- iv. Technical assistance for technology development, adaptation and innovation solutions;
- v. Awareness raising about RECP and dissemination of project results;

EBRD's Western Balkans Sustainable Energy Financing Facility (WeBSEFF) 2

The WeBSEFF 2 provides debt financing for privately developed energy efficiency projects (in industry or in buildings) and renewable energy projects. WeBSEFF 2 is conceived as an instrument for encouraging businesses to pursue sustainable energy projects that are often challenging to finance and implement. Therefore, it is designed to provide financing as well as technical assistance to businesses and local commercial banks.

On a regional level the total size of the project is EUR 75 million, of which EUR 10 million are expected to be disbursed in Macedonia during the period May 2013 to November 2016. At least half of the funds available for WeBSEFF 2 are expected to target the public sector.

A.4.5.5 Industrial energy efficiency investments and financing

Table 6 shows the list of the ongoing on-lending financing facilities currently operational and available in Macedonia, either targeted or open to IEE projects and investments.

Table 6–ON-LENDING financing facilities offered by IFIs in Macedonia

On-lending Financing Facility	IFI	Amount [Mio €]	IEE Relevance	Local Banks Involved	TA Provided	Premium Provided	Performance Requirement
Western Balkans Sustainable Energy Financing Facility (WeBSEFF) - I	EBRD (2009)	59	Dedicated to EE/RE	2	YES	YES	Eligibility & Premium
Western Balkans Sustainable Energy Financing Facility (WeBSEFF) - II	EBRD (2013)	75 ^a	Dedicated to EE/RE	1 ^b	YES	YES	Eligibility & Premium
EE and RE Credit Line	KfW	7	Dedicated to EE/RE	1	NO	NO	Eligibility
Green for Growth Fund - Southern Europe	WB	5	Dedicated to EE/RE	1	NO	NO	Eligibility
SME Competitiveness Credit Line	KfW & EBRD	8	Open to IEE	3	YES	YES	Eligibility & Premium
Credit Line for SMEs and Priority Projects (through the Macedonian Bank for Development Promotion)	EIB	100	Open to IEE	11	NO	NO	Eligibility
Financing Sustainable Energy Projects Credits Line (through the Macedonian Bank for Development Promotion)	WB	3	Dedicated to EE/RE	5	NO	NO	Eligibility

Notes: a – This amount is for the whole regional program. As of Feb 2014 6 million have been allocated to Macedonian banks.

b – Two Macedonian banks are negotiating participation and they are expected to join this year

Table 7 shows the list of the IFIs' direct lending facilities currently operational and available in Macedonia.

Table 7 - DIRECT lending financing facilities offered by IFIs in Macedonia

On-lending Financing Facility	IFI	Amount [Mio €]	IEE Relevance	Loans size [Mio €]	TA Provided	Premium Provided	Performance Requirement
Western Balkans Sustainable Energy Direct Financing Facility (WeBSeDFF)	EBRD	50	Dedicated to IEE	> 2	YES	YES	Eligibility & Premium
Green for Growth Fund - Southern Europe	WB	NA	Dedicated to IEE	3-10	YES	NO	Eligibility

These financing facilities have certainly achieved good results and impact in stimulating more investments in EE by industrial companies and in building capacity of some local banks and reducing transaction costs for new projects portfolios and products offers.

However, the number of enterprises that could get loans from the EE dedicated financing facilities or directly from the IFIs was still limited as result of either limited capacity of enterprises to prepare suitable project proposals and

investment/loan applications or inability of enterprises to meet IFIs and/or local banks financial/risk requirements¹² especially because of their creditworthiness rate, low for many Macedonian enterprises and SMEs in particular.

Even when the IEE investment and improvement measures have been properly identified, analyzed and prepared, many Macedonia industrial enterprises are constrained with regard to access to finance due to their current overall business performance, financial position and corresponding capital structure (debt to equity), and inability to offer credit collaterals in terms of pledge on fixed assets (property, plant and equipment). As result of the global financial and economic crisis, significant portion of the financing activity within the Macedonia economy during the last 2-3 years was about either re-programming or re-financing existing loans/debts. Loan securitization requirements by commercial banks and inability of enterprises/SMEs to provide sufficient collateral are in many instances the real stumbling blocks for access to finance of otherwise solid investments with very good financial and economic returns potential.

To help address the specific problem of SMEs' creditworthiness and support their investments, two Credit Guarantee Schemes have been put in place and are at the moment operational. The first one to be introduced in the market was the special guarantee scheme offered to SMEs by the Macedonian Bank for Development Promotion. Its purpose is to support financing of projects/loans of limited amount and of companies, usually in their early growth stage, by covering portion of the total collateral requirements (up to 30,000 Euro).

The second credit guarantee scheme is the USAID DCA¹³ Guarantee scheme, available through two facilities:

- a. SME sector financing support – 9 million USD (operational until end 2014);
- b. Energy Efficiency investment projects in private and public sector - 10 million USD (operational until 2019).

The USAID DCA Guarantee facilities cover 50% of the loan amount in case of default, substantially reducing the risk for the banks and in so doing leading to less demanding banks' requirements for loan securitization and collaterals. Applicable to SMEs' loans of up to 500,000 USD, the USAID DCA Guarantee facilities have certainly had a positive impact and enabled investments that would have not been otherwise implemented. However, performance has been below expectations in terms of industrial SME EE projects submitted and funded. A partial reason for that which was identified was the SMEs' lack of capacity to prepare suitable investment proposals; or from a different perspective, the lack of a technical assistance component for EE projects preparation.

A. 5. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

Project Objectives

The project aims to accelerate the transformation of the Macedonian market for industrial energy efficiency towards increased use, demand and provision of IEE best-available practices and technologies and related consultancy and investment related services.

¹³ Development Credit Authority

Project Approach

The project objective is pursued through barrier-mitigation interventions at three levels:

Policy, regulatory and institutional level – Project Component 1

The problems that the GEF-UNIDO project aims to further address and mitigate at the policy and institutional level are:

- i. The very limited knowledge, expertise and capacity for assessing and developing policies, regulatory measures and programmes for industrial energy efficiency;
- ii. The poor visibility and profile of industry within the EE policy and programmes portfolio of the Government despite its major expected contribution to the achievement of Macedonia's energy savings goals and obligations;
- iii. The limited focus and ability of the Government in supporting the implementation of the NEEAPs measures, in particular in industry;
- iv. The limited budget and human resources for proper policy planning and development;
- v. The constrained knowledge, capacity and resources for assessing cost-effectiveness, potential impact, implementation costs and feasibility of industrial EE policies;
- vi. The limited visibility of synergies between EE in industry, technology modernization, competitiveness and Climate Change mitigation.

The project wants to raise the profile of industry within the EE policy-making and institutional space and to catalyze the establishment of a long-term programmatic framework that promotes and support sustainable improvement of industrial energy efficiency and climate footprint.

The project builds on the Macedonian Government's focus on developing legislation and capacity for meeting the obligations and targets set out in the Energy Community Treaty and complements it with targeted support for EE policy implementation and incentives and increased capacity for industrial energy efficiency policy- and program-making.

Interventions under project component 1 (PC1) aim to accelerate development and establishment of policies, legislation and programs specifically targeted to promote and support energy efficiency in industry; and to ensure that decision-makers and officials of policy-making and policy-implementing institutions enhance their knowledge, attention to and ability to promote and support industrial energy efficiency in a sustainable and progressively more effective way.

At the policy, regulatory and institutional level the baseline project for the GEF-UNIDO project will be specifically represented by:

- a. The Government and Ministry of Economy focus and resources to develop laws, regulations and programmes to meet the binding obligations and targets of the Energy Community Treaty;
- b. The framework and driver for Government's and donors' action provided by the Second NEEAP, which includes measures and actions promoting and supporting energy management in industry and optimization of industrial process heating systems and motor-driven systems;
- c. The technical assistance and capacity building provided to the Ministry of Economy and to the Energy Agency within the EU Instrument for Pre-Accession Assistance (IPA) project;
- d. The technical assistance provided to the Ministry of Economy and to the Energy Agency within the USAID Low Emissions Development and Clean Energy Investment (LED-CEI) project;
- e. The work of the Ministry of Environment and related technical assistance provided within the scope of the EU Emission Trading Scheme Implementation – Preparatory phase project;
- f. The work of the Ministry of Economy and the Energy Agency to establish a well-structured and institutionalized monitoring, reporting and verification framework for energy performance and energy savings;
- g. The existing programme of the Ministry of Economy, Department of Industrial Policy, to support Macedonian enterprises' competitiveness through subsidies for compliance with and certification to international management systems standards such ISO 9001 and ISO 14001.

Industrial Energy Efficiency Market level – Project Component 2

The problems that the GEF-UNIDO project aims to specifically and further address and mitigate at the level of energy efficiency in industrial enterprises and relevant market development are the following:

- i. The limited or lack of understanding and capacity within enterprises to assess energy performance, identify opportunities and size/estimate costs and benefits of EE improvement interventions to make informed decisions;
- ii. The wide and persisting mind-set of enterprises to see and approach energy efficiency largely as ad-hoc or contingent matter and therefore reaping only partial and short-lived economic and performance benefits;
- iii. The still incomplete market offer and limited availability of expert services for a good number of industrial EE best-available practices and techniques with substantial technical and economic energy saving potential in Macedonian industry and other economy's sectors;
- iv. The limited availability or lack of Macedonian success stories demonstrating feasibility, effectiveness and benefits of selected IEE best-available practices and techniques application in Macedonian's enterprises.

The project will intervene both on the demand for and the supply of services and technologies for IEE through a tailored mix of capacity building, direct implementation support and piloting of new solutions. The project will specifically focus on:

- a. boosting the adoption of and service offer for energy management systems (in line with ISO 50001) as the best approach and methodology to integrate EE in industry daily business practices, including investment decisions, and achieve sustainable and continual improvement of energy efficiency and performance;
- b. boosting the adoption of and service offer for industrial energy system optimization given its substantial energy savings and market potential in the light of its industry cross-cutting nature and low-medium capital intensity.

These results will be pursued through:

- ✓ Skills and expertise upgrade of national IEE consultants and service providers through training, hands-on experience and coaching by international leading experts;
- ✓ Knowledge dissemination and training of industry decision-makers and enterprises' "energy significant" personnel;
- ✓ Facilitated pilot implementation of energy management systems in line with ISO 50001, steam system and compressed-air system optimization assessments and projects;

In view of their major energy consumption and consequent sizable potential for energy savings, the project targets primarily energy intensive and large enterprises from the Iron and Steel, Petrochemical, Construction and Food sectors. These sectors account for about 86% of total industrial energy consumption in Macedonia, with Iron and Steel alone accounting for 62%. Out of the 7 manufacturing enterprises that have so far signed co-financing commitment letters three are Iron and Steel making, one is a refinery, one is a construction material company and two are food producers. Negotiations took place and will continue after project start to engage with the largest Macedonian cement producer as well as other few large industrial energy consumers. Selection of partner enterprises was based on following criteria:

- i. High energy consumption and consequent size of potential energy savings;
- ii. Replication potential in the sector;
- iii. Demonstrated interest in EE and in the project activities through letters of co-financing commitments.

The industrial EE best-available practices and technologies to be promoted, supported and demonstrated under project component 2 (PC2) project are:

- i. Energy Management Systems (EnMS) in line with ISO 50001;
- ii. Steam System Optimization (SSO);
- iii. Compressed-air System Optimization (CASO).

The rationale for selecting these three best-available techniques/technologies is the following:

1. EnMS is the best proven methodology to ensure integration of EE in daily business practices and continual improvement of energy performance;
2. International substantial experience, including that of UNIDO, shows that effective implementation of EnMS

leads to enterprise-wide annual energy efficiency improvement rates at least 2-3 times higher than those under business as usual scenarios (BAU) where:

- a. the BAU scenarios include large energy intensive enterprises with environment management systems and energy programs already in place; and
 - b. energy savings and efficiency gains are achieved with no or very limited capital investments during the first two years;
3. It is demonstrated that the energy system optimization (ESO) approach provides larger energy savings than single-piece of equipment replacement approach (15-30% against 3-5% of equipment approach);
 4. ESO projects' requirements for capital investments are on average not too demanding (small-medium size), making them more viable for companies with financial resource or access to financing constraints;
 5. Payback periods for many ESO projects and many EnMS measures are in the range of 0 to 12 months;
 6. Increased understanding of ESO principles and fundamental operations is instrumental to enterprises improved operation and control of existing systems and greater effectiveness/impact of EnMS;
 7. EnMS and ESO techniques/technologies are cutting across the whole industry sector; in a small economy like Macedonia this provides larger potential market volumes and consequent returns for initial TA and private sector resources investments;
 8. The specific selection of Steam and Compressed-air Systems is based on the significant share of energy consumption they account for in most industrial sub-sectors, their prioritization by the Government within the Second NEEAP as industrial EE technologies to promote, the average age of the current stock of boilers and compressors (which seems to be higher than that of other energy auxiliary systems, i.e. pumps, fans and other motor-driven systems), the assessed gap in the provision of state-of-the-art expert services, especially in the case of compressed-air systems optimization.

In order to achieve greater knowledge and skills absorption impact, cost-effectiveness and to support sustainability of services PC2 makes use of a train-the-trainers approach.

The baseline project for the GEF-UNIDO's interventions under PC2 will be specifically represented by:

- a. The draft Second NEEAP's call for measures and actions promoting and supporting energy management in Industry as well as in the Public and Commercial/Building sectors;
- b. The draft Second NEEAP's call for measures promoting optimization of industrial process heating systems and motor-driven systems;
- c. The USAID Industrial Energy Management (IEM) Project;
- d. The UNIDO Low Carbon Production in the Agro-Industry Project;
- e. The UNIDO's capacity building programs for EnMS, SSO and CASO and the associated knowledge assets;
- f. The knowledge assets and facilities of the UNIDO Cleaner Production Centre in Skopje;
- g. The facilities of the Faculty of Mechanical Engineering and the Faculty of Technology and Metallurgy in Skopje;
- h. The staff, in-kind and cash resources of the enterprises participating in the project.

Investments in industrial energy efficiency – Project Component 3

The problems that the GEF-UNIDO project aims to specifically and further address and mitigate at the level of IEE investments are the following:

- i. The limited number of good (i.e. properly prepared for appraisal) IEE investment proposals that are submitted by enterprises to Macedonian commercial banks;
- ii. The availability of a limited pool of local banks with some good understanding, expertise and experience in lending for IEE investments;
- iii. The below-expectation performance and disbursement rates for industrial energy efficiency of some of the existing on-lending financing facilities, i.e. those open to IEE and/or those without project preparation technical

assistance and/or cash premium elements.

The baseline situation shows that there are a number of ongoing programs financed by different international financing institutions (EBRD, EIB, KfW, WB) and donor agencies (USAID) that are providing credit lines (either dedicated or open to energy efficiency projects) or guarantees for EE investments industry. Despite these programs as well as the availability of significant funding to local financing institutions, the level of investments in industrial EE still remains low compared to expectations and estimated economic profitability of many EE projects and solutions.

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:

- a. increasing the quality and number of IEE projects and investment proposals submitted to Macedonian banks;
- b. increasing the incentives for enterprises and banks to invest and engage in industrial energy efficiency projects.

Project interventions under PC3 are meant to be beneficial and open to any industrial enterprise, large ones as well as SMEs, no matter what is the manufacturing sector or sub-sector. It is to mention that industrial EE projects and investments to be incentivized and facilitated through PC3 will not include the ten low cost energy efficiency projects that are expected to be implemented by partner industrial enterprises under PC2 (i.e. Output. 2.3).

The baseline project for the GEF-UNIDO interventions in the area of IEE investments will be specifically represented by:

- a. The on-lending financing facilities administered by the Macedonian Bank for Development Promotion;
- b. The USAID Industrial Energy Management (IEM) Project.

All project interventions will rely on tailored technical assistance combining international and national expert advice and direct support, knowledge assets and training, demonstrations, technology promotion and investment support.

Component 1- Strengthening Macedonian policy, regulatory and institutional frameworks and capacity for market transformation for industrial energy efficiency and green industry

On the one hand, PC1 focuses on developing and implementing a coherent set of normative, incentive and voluntary measures and programs that can operationalize and translate into tangible impact the substantial EE policy-and legislation-making work done over the last 5 years by the Macedonian Government and framed in its Second National Energy Efficiency Action Plans.

On the other hand, PC1 aims to catalyze further development of the Macedonian programmatic framework for IEE through support of and synergies with initiatives for the development of market-based and technology transfer mechanisms for GHG emission reductions such as the EU Emission Trading Scheme and the UNFCCC Climate Technology Centre & Network (CTCN).

Output 1.1 Legal requirements for large industrial and public sector energy consumers to have a certified Energy Management Practitioner are developed and enacted

In the draft Second NEEAP energy management is a planned energy saving measure in the Public Sector, the Commercial Sector and the Industrial Sector. The successful implementation of an effective energy management system (in line with ISO 50001) that saves energy and money, and ensure continual improvement of energy efficiency and energy productivity is primarily a matter of management commitment, people/employees knowledge and skills, and ability to guide the process of change and improvement that is associated with the introduction and implementation of effective energy management.

What do UNIDO and ISO 50001 mean by Energy Management System?

The energy management system (EnMS) referred in this document IS NOT based on the introduction of hardware devices and software to measure and monitor electricity consumption and/or to project and balance electrical power demand. The EnMS referred to and proposed by the present project requires the introduction in enterprises and organizations of a systematic/ structured approach to the management of energy in all its forms (electricity, fuels, heat and water where appropriate) and at all levels of an organization (management, policy, planning, operations, design, procurement and investments). It requires organizations and their employees to build new knowledge, understanding and skills, and willingness to challenge and change established procedures, processes and work behaviors.

Most medium-size and large enterprises as well as large public and commercial energy users have already staff dedicated, part-time or full-time, to “manage” energy. In the majority of the cases work is limited to managing energy budget and doing or supervising maintenance to secure continuity of production and/or services. Considering that, introducing a legal requirement for large industrial and public sector energy consumers to have a certified Energy Management Practitioner (EnMP) would not represent a demanding requirement or a significant additional cost.

The legal requirement would basically result in obligated organizations to have one employee (the right one) to attend the EnMP certification program, being trained and carrying out initial activities to set-up and implement an EnMS in her/his enterprise/organization. Having a certified Energy Management Practitioner (EnMP) will enable enterprises and organizations to improve the way they manage energy, develop energy management plans and identify opportunities to start savings energy and money at no or low cost.

From a policy-maker and institutional perspective, work and resources needed to administer and enforce the requirement would be very small, given the relatively limited number of companies and organizations to be obligated, and the need to verify only the successful participation in and completion of the Energy Management Practitioner (EnMP) certification program. At the same time, significant impact could be achieved, taking into account also the synergies with concurring regulatory initiatives and technical assistance efforts. The EnMP requirement would be clearly instrumental to the implementation of the 2nd NEEAP Energy Management measures and it would benefit the national IPPC protocol through better and more effective compliance with energy related obligations (i.e. development of energy management plans and adoption of basic energy management/efficiency practices), since many of the industrial enterprises that would be obligated to have an EnMP are part of the national IPPC protocol.

The project will work with the Ministry of Economy, the Energy Agency and the Ministry of Environment, other relevant Government counterparts and key stakeholders such as industrial associations and civil society organizations to develop and enact the proposed legal requirement. The key activities under Output 1.1 will be:

- i. The establishment of an Expert Working Group with the Energy Agency, relevant Ministries and experts to discuss and define the criteria for the selection of the obligated organizations; to carry out cost-benefits analysis for different sets of criteria and associated group of obligated organizations; to discuss and define enforcement modalities such as monitoring, measures/penalties for non-compliance, etc. and estimate associated costs;
- ii. Identifying and securing suitable resources for the sustainable monitoring and enforcement of the EnMP requirement;
- iii. Drafting or amending of legislation/regulation needed to introduce the EnMP requirement;
- iv. Facilitating stakeholders consultations;
- v. Assisting in the legislation/regulation approving and enacting process.

With regard to sustainability, the proposed legal requirement is envisaged to require limited operational resources. Once approved, the associated monitoring and enforcement activities will be integral part of the institutional duties (and corresponding budget/resource endowment) of the Government institution appointed to introduce and enforce the requirement.

Output 1.2 Certification Program for Energy Management Practitioner (EnMP) is developed and enacted

The EnMP Certification Program would serve the following purposes:

1. Providing a complementary constituting element of the proposed legal requirement for large industrial and public sector energy consumers to have a certified EnMP;
2. Ensuring that the EnMP legal requirement will deliver tangible benefits to the obligated organizations in terms of energy/cost savings and enhanced overall performance; and to the Macedonian Government and economy in terms of improved energy productivity and climate/environmental footprint;
3. Establishing a sustainable mechanism to provide a response (i.e. training and skills development) to the existing major deficiency in industry (as well as in other sectors) of personnel and professionals qualified for and competent in implementing EnMS in line with ISO 50001, and to enrich the service offer of the local IEE market.

The EnMP Certification Program would lever and build on:

- a. The legal framework, structure and procedure of the Energy Auditor Certification Program developed by the Ministry of Economy and that the Energy Agency is putting in operations;
- b. The EnMS training curricula, material, exams, knowledge assets, implementation supporting tools and trainers developed and used under Project Component 2 – Output 2.1.

The EnMP Certification Program will be developed taking into account leading examples like the ANSI Accredited Certified Practitioners in Energy Management Systems programme as well as established best practices with proxy programmes such as the Certified Energy Manager® (CEM®); the European Energy Manager and the Energy System Assessment Specialists of the US Department of Energy.

The project will work with the Energy Agency, the Ministry of Economy and other relevant Government counterparts, key stakeholders such as industrial and professional associations, the University St. Cyril and Methodius and national accreditation body to develop and enact the EnMP Certification Program. The key activities under Output 1.2 will be:

- i. Establishing a Working Group with the Energy Agency, relevant Ministries and experts to develop the EnMP Certification Program with respect to the training curriculum, the structure (whether and which mix of online learning, face-to-face classroom workshop, self-study, examination, etc.), the administration and operations procedures, the associated costs and potential revenues, the qualification requirements for the EnMP trainers, etc.;
- ii. Defining the institutional arrangements for the hosting and delivery of the EnMP Certification Program. Based on discussion with Government counterparts and stakeholders the Energy Agency has been identified and indicated as good relevant candidate institution to host the EnMP Certification Program in the light of its experience with the Energy Auditor Certification Program;
- iii. Defining the mechanism to ensure the resources needed for the sustainable operation of the EnMP Certification Program;
- iv. Supporting the accreditation of the EnMP Certification Program by relevant national institutions;
- v. Drafting or amending of legislation/regulation needed to introduce the EnMP Certification Program. This work will build on the expertise and experience accrued by the Ministry of Economy and by the Energy Agency with the development and introduction of the Rulebook on Energy Audits;
- vi. Assisting in the legislation/regulation approving and enacting process.

The Energy Management Practitioner (EnMP) Certification Program is intended as complementary constituting element of the corresponding proposed legal requirement for large industrial and public sector to have a certified EnMP. Once the legal requirement would be approved, the operations of the EnMP Certification Program are expected to be integrated in the institutional duties (and corresponding budget/resource endowment) of the Government institution selected to administer the EnMP Certification Program. Taking into account current roles and responsibilities of relevant Government institutions and the similarity of the proposed certification program with existing ones, the Energy Agency is likely to be appointed as administrator of the EnMP Certification Program. During the development phase of the legal requirement and of the certification program, the possibility of charging a small fee to the EnMP obligated parties and a higher fee to non-obligated parties will be analysed.

Output 1.3 Financial incentives for ISO 50001 Certification are developed and enacted

The financial incentive is meant to reinforce the policy push for EnMS and energy efficiency implementation in industry and other sectors and it is expected to attract the attention especially of those companies that are more export oriented and therefore confronted with international competitiveness benchmarks and market requirements.

The financial incentive for ISO 50001 Certification will be shaped along the lines of the financial incentive programme offered in the past by the Ministry of Economy for certification to other ISO management system standards such as ISO 9001 and ISO 14001. As result, a relatively simple process and limited effort will be required to amend/adapt the existing relevant legislation/regulation to add ISO 50001.

The financial incentive is also intended to serve as a catalyst for the development of a local market offer for ISO 50001 auditing and certification services. In this regard it is to mention that Macedonian companies offering conformity assessment services (audit of and certification to ISO 9001 and other management system standards) will be one of the target beneficiary groups of the Energy Management System capacity building program to be implemented under Project Component 2 with the objective of accelerate the development process of their ISO 50001 service offer. During the PPG the UNIDO team met with representatives of Macedonian certification companies and strong support to the project and interest in participating in its activities and capacity building program was expressed.

The project will work with Ministry of Economy, local conformity assessment service providers, industry associations, donors and the Ministry of Finance to develop and establish the incentive program. The key activities under Output 1.3 will be:

- i. Driving the process for the amendment of existing legal framework in order to add ISO 50001 to the list of management system standards for which a certification incentive/subsidy can be provided.
Based on discussion with the Department of Industrial Policy of the Ministry of Economy, it is anticipated that the same procedure used for ISO 9001 and ISO 14001 certification subsidy would be used. The subsidy amount is envisaged to equal the past one for ISO 9001 and ISO 14001, i.e. 3,000 USD per certification;
- ii. Promoting and advertising the incentive scheme between enterprises as well as auditing and certification service providers through both institutional and project channels;
- iii. Operating the incentive scheme through the Department of Industrial Policy of the Ministry of Economy;
- iv. Conducting a dialogue with the Ministry of Economy, the Ministry of Finance and the donor community to identify and secure resources for the extension of the subsidy scheme if industry's demand should prove to be sustained.

It is to mention that the proposed ISO 50001 certification financial incentive is intended as a short-term marketing/promotional intervention to stimulate the accelerated creation of a local market for EnMS/ISO 50001 services. The provision of past subsidies for certification to ISO 9001 and ISO 14001 standards has largely benefited from donor funded industrial competitiveness enhancement programs. Taking that into account, the project in collaboration with Government partner institutions will engage with the local donor community to mobilize funding for an extension of the financial incentive. In parallel, the project will engage in discussion with the Ministry of Economy and the Ministry of

Finance to explore the possibility and feasibility of “converting” the financial incentive in a fiscal incentive, i.e. providing companies that would be certified to ISO 50001 a tax credit equal to the subsidy amount. The “business case” for a tax credit from a Government perspective would be that the energy costs saved by companies as result of energy management system and energy efficiency implementation would be re-spent for other and more productive uses, in terms of socio-economic benefits, that would generate greater revenues flow for the national budget through income or corporate tax, VAT, sales and other taxes.

Output 1.4 National Industrial Energy Efficiency Best Practice Information and Dissemination (BPID) Program established and operational

The purpose of the BPID program is to address the substantial awareness and knowledge gaps between industry decision makers about IEE opportunities, benefits and costs. The BPID aims to provide information and tools to be used by both energy efficiency consultants and enterprises’ personnel (including certified EnMP) for building business cases for EnMS and IEE implementation; for identifying and developing energy savings measures and projects; for self-studying and learning; for connecting enterprises with EnMS/IEE specialists and service providers, and other.

The BPID wants to offer a reference point for energy management and IEE practitioners and for enterprises where to find information and resources for promoting, developing and implementing energy management systems and other IEE projects and measures. It wants also to offer a platform to raise awareness of an increasingly broader industrial audience about Macedonian best practices and success stories in the implementation of energy management system and energy efficiency in industry.

The BPID program will consist of the following elements:

1. Industrial Energy Efficiency Best Practices Information and Dissemination website

The website will be designed with the vision of being incrementally enhanced over time and widened in terms of technologies scope. The BPID website to be developed and established during the project implementation period will be focused on energy management and energy systems optimization. For each of these best-available techniques/technologies various types of resources will be developed and/or made available. These will include:

- a. Case studies on the implementation of EnMS, energy systems optimization and other IEE projects.
Case studies will be produced in different ways: translating international ones (UNIDO and other sources); using the results/case studies generated under Component 2 of the project; using results/ case studies generated by other IEE programs implemented in Macedonia such as the USAID Industrial Energy Management (IEM) project, the UNIDO Low Carbon Production in the Agro-Industry project, the EBRD WEBSseFF and others.
- b. Information and promotional material such articles for industry magazines and newsletters (i.e. Chamber of Commerce); brochures, fliers and newsletter for distribution (i.e. to enterprises, municipalities, regional and provincial offices of the Chamber of Commerce and associations alike); press releases about major IEE projects and/or achievements; short videos/movies about success stories, etc.
- c. Supporting tools for the implementation of EnMS and the identification, development and implementation of energy system optimization (ESO) measures in industry, such as:
 - Practical Guide for Implementing an Energy Management System
 - Tools and templates for EnMS implementation support
 - Manuals and handbooks for energy systems assessments and optimization
 - Additional sources of information and tools (Industrial Energy Data Management Framework guidance, Energy Management Plan templates for the IPPC Protocol, etc.)

2. Organization of 1-day annual technical workshop to present and exchange Macedonian experiences with respect to specific IEE best practices. These workshops will be primarily targeted to enterprises' engineers and managers and EnMS/IEE consultants and equipment vendors with the objective of facilitating wider and faster dissemination and replication of best practices through peer-to-peer discussion, and of catalysing the creation of IEE experts/stakeholders networks.

The IEE BPID Program will be developed and established together with the Energy Agency, the Chamber of Commerce and other stakeholders. The key activities under Output 1.4 will be:

- i. Establishing a Working Group with the Energy Agency and the Chamber of Commerce to drive and contribute to the development and establishment of the BPID Program;
- ii. Designing, developing and maintain the BPID website;
The website will be hosted and maintained by the Energy Agency.
- iii. Developing Macedonian EnMS, ESO and other IEE case studies;
- iv. Translating manuals, handbooks and tools in Macedonian
This work will be a joint effort together with the USAID Industrial Energy Management project, the UNIDO National Cleaner Production Centre and the Faculty of Mechanical Engineering of the University of St. Cyril and Methodius
- v. Producing general EnMS/IEE information and promotional material
- vi. Promoting the IEE BPID website through all relevant institutional and associations networks as well as all relevant UNIDO and USAID IEM project activities
- vii. Organizing 1-day annual Macedonian IEE Best Practices workshop (2 workshops organized during project implementation)
These events will be jointly organized with the support of the Energy Agency, the Chamber of Commerce and the UNIDO National Cleaner Production Centre. Collaboration with other relevant stakeholders and sponsorships from private sector and donors will be sought.
- viii. Conducting a dialogue with the Energy Agency, the Chamber of Commerce, the Ministry of Economy and other relevant partners to identify and secure resources for the continuation and further development of the BPID program beyond the GEF-UNIDO project duration.

Promotion and dissemination of information and knowledge about energy efficiency is an institutional mandate of the Energy Agency, recipient of and eligible for funding within the framework of the Macedonian NEEAP and the EU IPA project. Partnership and collaboration with the Macedonian Chamber of Commerce, industrial associations and potential sponsors for the BPID program (i.e. utilities, industrial equipment and energy efficiency solutions suppliers, others) will be also sought to ensure that maintenance and operation costs of the BPID program will be covered after project completion.

Output 1.5 Industrial Energy Data Management Framework developed

As described earlier in this document, since the beginning of the PPG phase a number of new donor funded programs were initiated to improve on the one hand the national institutional capacity and framework for Monitoring, Reporting and Verification of energy performance and indicators for the different economy's sectors and on the other, to build initial national capacity for future participation of Macedonian large and energy intensive industrial enterprises in the EU Emission Trading Scheme (ETS).

The Industrial Energy Data Management Framework will leverage the data management discipline introduced by ISO 50001 EnMS and the EnMS implementation work that the GEF UNIDO project will carry out under Component 2 with a number of Macedonian large and energy intensive industrial enterprises to develop a linking map that explicitly links

EnMS-ISO50001 data management and energy performance indicator requirements with the data collection requirements for industrial sector/sub-sector energy efficiency performance of the national MRV framework and the benchmarking and reporting requirements for the EU Emission Trading Scheme.

The objectives of the Industrial Energy Data Management (IEDM) Framework are:

- a. To provide relevant public institutions (Ministry of Economy, Energy Agency and Ministry of Environment) with a tool that can ensure greater coherence, increased effectiveness and reduced administration costs of inter-linked policy instruments such as EnMS-ISO50001, MRV and EU ETS;
- b. To enable MRV and EU ETS benchmarking efforts to effectively build on and benefit from EnMS-ISO50001 implementation and associated strong data management discipline;
- c. To 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.

The project will work with the Ministry of Environment, the Energy Agency, representatives of large and energy intensive industrial enterprises, relevant donors' agencies and other relevant stakeholders to develop the Industrial Energy Data Management Framework. The key activities under Output 1.5 will be:

- i. Establishing a Working Group with relevant officials working on MRV, EU ETS and EnMS-ISO 50001, national experts and key stakeholders representatives to work on the IEDM Framework;
- ii. Organizing a workshop for the IEDM Working Group experts for initial comparison and discussion of data requirements under different policies/schemes;
- iii. Developing the IEDM Framework and accompanying guidance document;
- iv. Conducting a dialogue with the Ministry of Environment, the Energy Agency, the Ministry of Economy, the Government of Norway and other interested partners to ensure the integration of the Industrial Energy Data Management Framework in future IEE policy and programme development work, especially for the MRV and EU ETS initiatives.

Output 1.6 Assessment of Climate Technologies potential in industry carried out

This output aims at enabling an accelerated pace and rate of penetration of climate change mitigation or adaptation technologies in the Macedonia industrial sector by filling the knowledge gaps that are preventing the development of targeted policy interventions and technical assistance programs to promote and support transfer to and adoption by Macedonian industry of specific best-available climate change mitigation or adaptation technologies. At the moment it is unknown to the Macedonian Government which industrial climate change mitigation or adaptation technologies offer the best technical, economic and social potential, since no assessment of needs and potential for the manufacturing and mining sectors has ever been carried out.

Within the current framework of the national Integrated Pollution Prevention and Control (IPPC) Protocol, some Macedonian companies have to develop and implement "adjustments plans" in order to be granted and retain permits of operations. Adjustments plans have to be prepared taking into the BAT Reference Documents (BREF) approved by the European IPPC Bureau for respective industrial production sub-sectors. While these BREFs provide very good information and guidance on best options available, they do not set obligations. The final decision and associated obligations on which BATs a specific industrial facility/installation should pursue and implement within the adjustment plan is a matter of negotiations between the facility/installation operators and the national designated authority.

The MoEPP has established a Scientific Technical Commission for Best Available Techniques with the task of defining BATs for integrated environmental A permits, but due to its limited staff, technical capacity and budget resources work has been so far limited to BATs for production of steel and BATs for wastewater treatment and air emissions, and only for new industrial installations (i.e. to be built). Adjustments plans submitted and the dialogue with industrial facilities have not been used so far to inform any initiative or program to promote or support specific technologies, with the

ultimate result that negotiations always lead to pretty conservative and sub-optimal targets (environmentally and economically) that can be achievable with sole enterprises' resources.

The Assessment of Climate Technologies potential in industry has the objective to identify, evaluate and prioritize climate technological options for the Macedonian industry in order to then develop and formulate strategies, policies, programs and projects as more appropriate. The MoEPP will use the results of Assessment as input to the development and prioritization of its working plan as Macedonian National Designated Entity (NDE) for the UNFCCC Climate Technology Centre and Network (CTCN).

The MoEPP will lead the work and execution of the Assessment in collaboration with relevant stakeholders, including the Department of Industrial Policy of the Ministry of Economy, the Faculty of Mechanical Engineering, the Faculty of Technology and Metallurgy, the Chamber of Commerce and Industry and other scientific and industry representatives. The key activities under Output 1.6 will be:

- i. Establishing the Working Group that will define the process for the Assessment, coordinate and carry out the work. Representatives of local and international financial institutions will be request and invited to participate in the Working Group.
It is anticipated that the Assessment work will take into account adjustments plans of IPPC obligated facilities and it will make use of available supporting tools such as Climate Techwiki.
- ii. Carrying out the technologies identification and evaluations.
It is anticipated that collaboration and synergies with the CTCN will be sought already at this stage.
- iii. Organizing 1-2 technologies familiarization events for key stakeholders during the technologies prioritization phase.
- iv. Preparing the Assessment report, including an actions plan for short- and medium-term follow-up activities.

The project will work closely with the Ministry of Environment and Physical Planning (MoEPP) to ensure that findings and recommendations of the Climate Technologies assessment will be integrated in the work plan of the Macedonian CTCN DNE as well as in that of the MoEPP IPPC Scientific Technical Commission for Best Available Techniques.

Output 1.7 Strengthened technical capacity of Macedonian institutions responsible for developing, implementing and monitoring industrial energy efficiency and climate change mitigation policies and programs; 25 public officials trained

This output will be largely the results of training, learning-by-doing and activities carried out with and by the various institutional partners of the project under the different outputs of Component 1, all aimed to raise the profile of the industrial sector within the national EE policy and programs portfolio. In addition to such diffused capacity and competencies building work, two additional 1-day training on specific industrial energy efficiency policy topics that will emerge as highly beneficial during the project implementation period will be organized for relevant officials of policy-making and/or policy-implementing institutions.

The project will work with the Ministry of Economy, the Ministry of Environment, the Energy Agency and relevant donors' agencies and stakeholders. The key activities under Output 1.7 will be:

- ✓ Carrying out a small survey between key relevant institutions to identify high-priority training needs in the thematic areas of EE and CCM in industry
This survey will be carried out in coordination with the UNIDO Low Carbon Production in the Agro-Industry project, the USAID Low Emissions Development and Clean Energy Investment (LED-CEI) Project and other donor-funded programs interested in enhancing their technical assistance support in the industry area.
- ✓ Organizing and delivering the 2 trainings

The trainings will be jointly organized and delivered with relevant other donor-funded programs, including the UNIDO

Low Carbon Production in the Agro-Industry project and the USAID Low Emissions Development and Clean Energy Investment (LED-CEI) Project.

The increased understanding of key Government counterparts of the importance of IEE in achieving national energy savings goals and obligations is expected to progressively drive more resources from both national budget and donors' contributions towards institutional capacity building for IEE. The project will work with the Ministry of Economy, the Energy Agency and the Ministry of Environment to ensure that the topics of IEE and climate friendly industrial technologies are well integrated in their capacity building plans for European Union and other donors' funding.

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

Component 2 is designed to introduce and support deployment of energy management systems (in line with ISO 50001) and best-available practices for industrial steam and compressed-air systems optimization in Macedonian enterprises and IEE market. This goal is pursued by working both on the demand and supply side of the local market for industrial energy efficiency services; on the one hand through knowledge dissemination and training of industry decision-makers and enterprises' "energy significant" personnel, and on the other via skills and expertise upgrade of national IEE consultants and service providers through training, hands-on experience and coaching of international leading experts. Component 2 does use a "Train-the-Trainers" approach.

Output 2.1 A group of 50 local energy efficiency and environment professionals are equipped with the technical expertise and tools required to:

- a. implement in industry Energy Management Systems (EnMS) in line with ISO 50001
- b. carry out industrial energy system optimization assessments
- c. train industry personnel in EnMS and energy system assessment and optimization
- d. offer EnMS, energy system assessment and optimization technical services to industry

This output will be achieved through the delivery of 3 training programs for local EE consultants and experts in the following technical areas:

1. Energy Management Systems (in line with ISO 50001) Implementation in Industry
2. Compressed-air Systems Optimization in Industry
3. Steam Systems Optimization in Industry

Each training program consists of classroom training, on-the-job experience and coaching by leading international experts. The objective of the programs is to equip local energy consultants and professionals with the expertise and the tools required to carry out the following activities:

- a. Providing technical assistance to enterprises and coaching facility personnel to implement energy management systems and to identify, develop and implement energy system optimization measures and projects;
- b. Conducting seminars and trainings for factory managers, engineers and other "energy significant" staff.

The rationale for selecting Compressed-air and Steam as energy systems on which focusing the capacity building program for EE service providers is the following: i) to align with the technology priorities and measures identified and set out in the 2nd NEEAP; ii) the higher percentage of compressed-air and steam systems older than 10 year compared to other auxiliary energy systems observed by the PPG survey; iii) the national experts' feedback about the type and quality of services offered on the local market in these two technical areas (and in particular for compressed-air), which would significantly benefit from expertise upgrading activities.

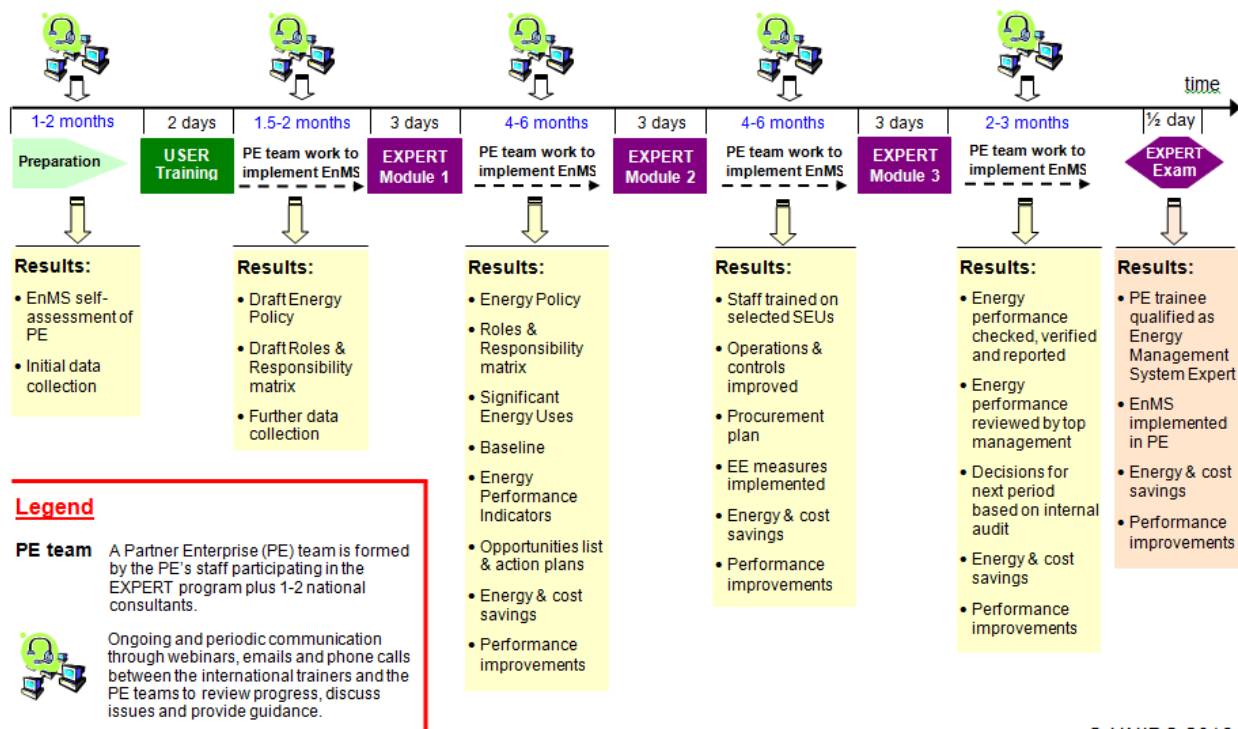
1. EXPERT Training Program on Energy Management Systems Implementation in Industry

The EnMS EXPERT Training Program consists of four modules plus a final exam:

- Module 1 – Overview
- Module 2 – Planning
- Module 3 – Implementation and Operation
- Module 4 – Checking and Management Review
- Final Exam

Modules are separated by a period of time which can range from 2 to 5 months. During these intervals, under the supervision and coaching of leading international EnMS experts, trainees apply on-the-job the knowledge, skills and tools provided through the class-room sessions by working in small teams with the selected project partner enterprises. Periodic webinars are organized during the program to monitor and review progress in the implementation of EnMS. At the end of the program all trainees have to sit the Final Exam of 3 hrs.

Participants in the EnMS EXPERT training program will consist of two groups of professionals: 1) energy efficiency consultants/experts and service providers active in the Macedonian market together with few professionals from higher education institutions - hereinafter all referred to as “consultants”; 2) representatives of enterprises partnering with the UNIDO-GEF project. The target consultants-enterprises ratio is 2:1, i.e. two consultants for each enterprise representative. The targeted total number of participants is in the range of 25-30 professionals. Consultants and enterprises representatives will be selected on the basis of well-defined set of criteria including qualifications, experience, reasons for participation and roles and responsibilities within the enterprise. Small teams comprising of 1 enterprise and 2 national consultants will be formed during the inception phase of the training program. Fig. 5 below shows the standard structure and schedule of the UNIDO EnMS EXPERT training program.



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Fig. 5 Structure and schedule of UNIDO EnMS EXPERT training program

It is to mention that enterprises participating in the UNIDO EnMS Expert program will include mainly large energy intensive enterprises from the iron and steel, chemicals and construction materials sectors, aiming for the largest

possible energy and GHG emission savings as well as for best complementarity with the USAID IEM project that has a focus on SME. The UNIDO EnMS Expert program will aim also for the participation of 2-3 large non-industrial public sector energy consumers such as the University of St. Cyril and Methodius and the Clinical Hospital of Skopje. The reason for involving these non-industrial large energy consumers is to demonstrate that EnMS/ISO 50001 is applicable and can deliver sizeable energy and costs savings also in public sector and non-industrial organizations. The project's goal and benefit would be that of demonstrating impact and generating case studies that could spur Government's actions for promotion and support programs also in non-industry sectors.

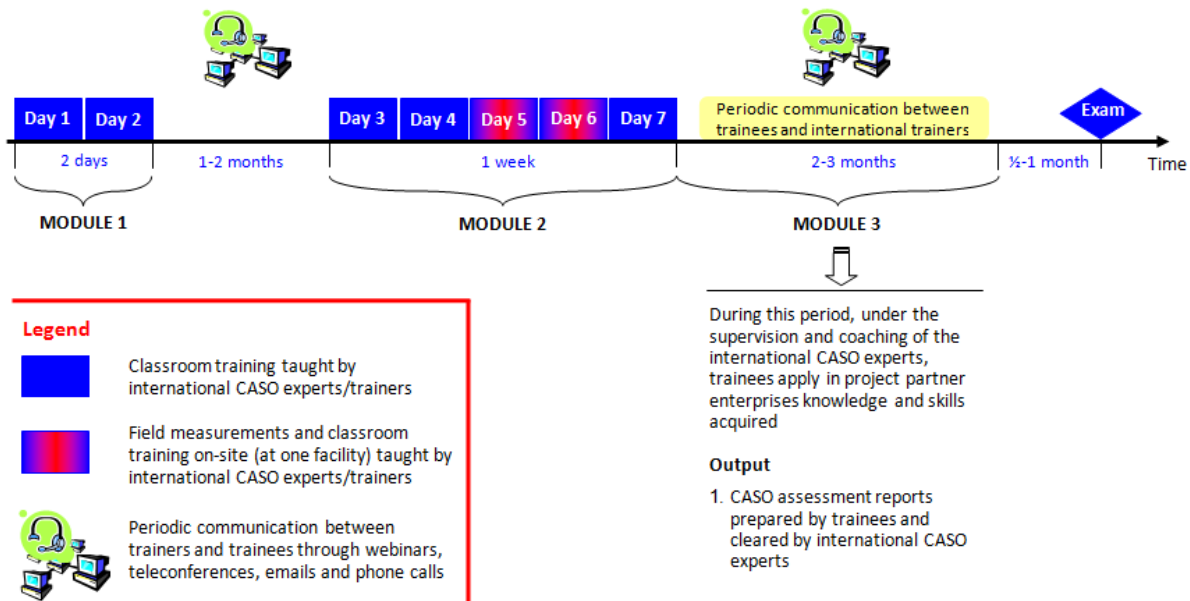
2. EXPERT Training Program on Compressed-air System Optimization in Industry

The Compressed-air System Optimization (CASO) EXPERT Training Program consists of three modules plus a final exam:

- Module 1 – Foundation of CASO (Class-room training)
- Module 2 – Advanced CASO (Class-room and on-site training)
- Module 3 – On-the-job practice and reporting
- Final Exam

Module 1 is delivered over 2 days. Module 2 is delivered over 5 days. Module 3 is distributed over a period of 2-3 months during which trainees apply on-the-job the knowledge, skills and tools provided through the classroom and on-site training sessions. Periodic webinars are organized during the entire program and in particular during Module 3. At the end of the program all trainees will sit a final exam of 3 hrs.

Participants in the CASO Expert training program will consist essentially of energy efficiency consultants/experts and service providers active in the Macedonian IEE market together with few professionals from higher education institutions. The targeted number of participants is in the range of 15-20 professionals. Participants will be selected on the basis of a well-defined set of criteria including qualifications, experience and reasons for participation. Fig. 6 below shows the standard structure and schedule of the UNIDO CASO Expert training program.



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Fig. 6 Structure and schedule of UNIDO CASO EXPERT training program

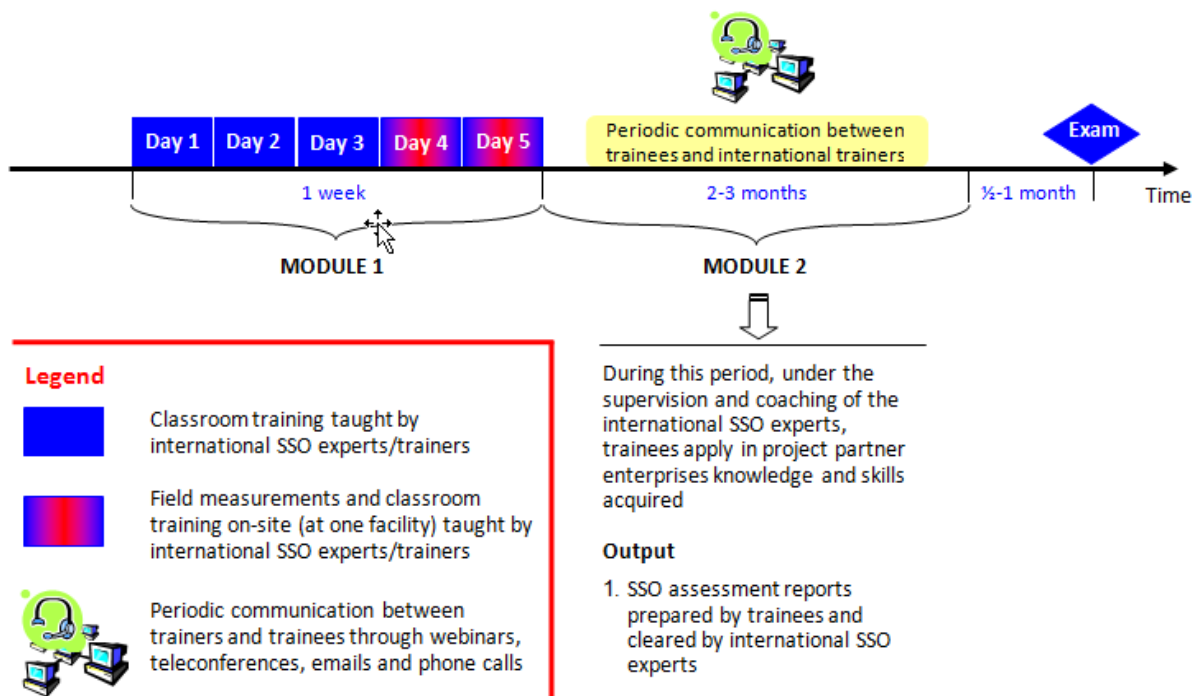
3. EXPERT Training Program on Steam System Optimization in Industry

The Steam System Optimization (SSO) EXPERT Training Program consists of two modules plus a final exam:

- Module 1 – Class-room and on-site training
- Module 2 – On-the-job practice and reporting
- Final Exam

Module 1 is delivered over 5 days. Module 2 is distributed over a period of 2-3 months during which trainees apply on-the-job the knowledge, skills and tools provided through the classroom and on-site training sessions. Periodic webinars are organized during the entire program and in particular during Module 2. At the end of the program all trainees sit a final exam of 3 hrs.

Participants in the SSO EXPERT training program will consist essentially of energy efficiency consultants/experts and service providers active in the Macedonian IEE market together with few professionals from higher education institutions. The targeted number of participants is in the range of 15-20 professionals. Participants will be selected on the basis of a well-defined set of criteria including qualifications, experience and reasons for participation. Fig. 7 below shows structure and schedule of the UNIDO SSO EXPERT training program.



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Fig. 7 Structure and schedule of UNIDO SSO EXPERT training program

Trainees that will successfully complete the EXPERT training programs will become eligible for being recruited by the GEF-UNIDO project to deliver shorter training to enterprises (please to Output 2.6) and/or to provide direct expert advice/support to enterprises receiving the project's technical assistance. All trainees that will successfully complete the EnMS and/or ESO EXPERT programs will be licensed, free of charge, the use of the whole training material for the provision of direct expert services to enterprises and the delivery of the USER trainings and the EnMS/ESO seminars.

Output 2.1 will benefit from the contribution of substantial in-kind resources and facilities to the organization and delivery of the three EXPERT Training Programs from many project partners, including the Faculty of Mechanical Engineering and the Faculty of Technology, the Regional Environment Centre (REC) Macedonia Office and the

UNIDO National Cleaner Production Centre (NCPC); partner enterprises and local EE consultants and service providers.

The key activities under Output 2.1 will be:

- i. Selecting the trainees for the EnMS, CASO and SSO EXPERT Training Programs;
Partner enterprises have been largely identified and selected during the PPG (please see Annex F).
- ii. Preparing training curricula, material and tools (in Macedonian);
UNIDO will contribute most of the training content from its existing knowledge and training assets. The Faculty of Mechanical Engineering, the NCPC and the USAID IEM will contribute resources towards the fine tuning of the material and its translation in Macedonian.
- iii. Ensuring technically sound and timely preparation of training logistics and delivery;
The Regional Environment Centre (REC) Macedonia Office will lead the work with technical support from the NCPC and with facilities and equipment from the Faculty of Mechanical Engineering and the Faculty of Technology.
- iv. Conducting a dialogue with Government counterparts and other partners, including the Energy Agency, the Chamber of Commerce and the Faculty of Mechanical Engineering, to negotiate and ensure the formal transfer of all EXPERT training programs to one or more qualified Macedonian institution.

In order to ensure replication and sustainability of the EnMS/ESO EXPERT training programs, after the pilot execution the programs will be transferred to qualified national institutions. The Faculty of Mechanical Engineering expressed already an interest in receiving the EnMS and ESO EXPERT programs. The Faculty of Mechanical Engineering and the Faculty of Technology will directly participate in the pilot EXPERT programs through the attendance of its staff and by supporting the organization of class-room events. The participation of the two Faculties, while aimed to enhance the expert service offers to industry and catalyze the introduction of EnMS and ESO in relevant university curricula, it is also intended as an opportunity for these two institutions to see and experience the programs delivery in order to be better able to replicate it on participant fee-basis.

During the preparation and delivery of the EXPERT trainings the project will closely liaise with the Macedonian Chamber of Commerce (MCC) to ensure their support and involvement as observer. The MCC offers fee-based professional training courses, including few in the domain of energy efficiency in buildings (initially sponsored by the EU or other sources). In any case, as recommended by and agreed with country counterparts, the recipients of the EnMS and ESO EXPERT training programs will be selected during the project implementation period based on a transparent process and in consultation with various counterparts and partners.

Output 2.2 Ten (10) enterprises from key Macedonian industrial sectors develop and implement Energy Management Systems (in line with ISO 50001)

The achievement of this output is largely based on the successful completion of the EXPERT Training Program on Energy Management System Implementation by the participating partner enterprises. At the end of the EnMS EXPERT Training Program, partner enterprises will have implemented and operational an effective EnMS (see Fig. 5) delivering tangible energy and cost savings, and almost third-party certifiable. It is important to mention here that the primary objective of Output 2.2 is the implementation of technically sound and effective EnMS (in line with ISO 50001) that save energy and money to the companies. The goal will not be to get these enterprises certified to ISO 50001. It will be up to the enterprises to assess and decide whether third-party certification would bring them additional market value.

Activities under this output are, to a great extent, integral part and linked to the activities carried out under Output 2.1. Additional activities to be carried out here will consist of UNIDO qualified national EnMS experts and international EnMS expert providing extra support to fine tune implementation of the EnMS in partner enterprises participating in the

EnMS EXPERT Training Program as well as providing expert technical assistance to 2-4 new partner enterprises in implementing EnMS in line with ISO 50001.

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 program of the project

The achievement of this output is largely integral part of the successful execution by project partner enterprises and national energy efficiency consultants of the Expert Training Program on EnMS Implementation, Compressed-air System Optimization and Steam System Optimization.

The evidence from UNIDO's past and ongoing projects, but also from other national programs supporting EnMS/ISO50001 implementation (USA, IRL), shows that as result of the implementation of EnMS in project partner enterprises and of the execution of energy system optimization assessments within the scope of the respective Expert Training Program, pipelines of energy performance and energy efficiency improvement interventions and projects are generated, many of which are so cost effective that enterprises autonomously implement them using their own resources. Fig. 8 show some numbers related to specific enterprises. More in general, UNIDO's multi-country experience shows that cash/capital investments during the first year of EnMS implementation can range from 2,000 USD to 400,000 USD depending of the size and financial strength of the company. It is to be pointed out though that during the first year of EnMS implementation, the most substantial share of energy savings is usually achieved through improvement measures that do not require cash/capital investments, so-called no-cost measures.

Activities under this output are linked to activities carried out under Output 2.1 and Output 2.2. Activities to be carried out here consist of technical expert support provided by UNIDO qualified national EnMS/CASO/SSO Experts and international expert to bring to the implementation stage a total of at least 10 low-cost energy efficiency projects with significant savings potential.

LACTIS improvements 2011-2012		AM Saldanha Improvements 2011-2012		Pump System Optimization	
Energy Management System Implemented		Energy Management System Implemented		Cooling Water Pumps Optimization	
No. of EnMS measures/projects	11	No. of Projects/Measures	12	Monetary savings/year (USD)	20,500
Total Capital Investment (USD)	6,900	Total Capital Investment (USD)	51,100	Energy Savings/year (MWh)	322.5
Gross Monetary Savings (USD)	22,000	2011 Gross Financial Savings (USD)	9,076,000	Cost of initiative (USD)	4,600
Overall Payback Period (in years)	0.32	Overall Payback Period (in years)	0.01	Payback Period	3 months
Annual Energy Savings (MWh)	328	2011 Energy Savings (GWh)	79.95	ton CO ₂ savings/year	310
2011 GHG Reductions (tons CO ₂)	160	2011 GHG Reductions (tons CO ₂)	77,000	Compressed-air System Optim.	
LACTIS J.S.C		ARCELORMITTAL SALDANHA WORKS		Compressors Optimization	
Moldova		South Africa		Monetary savings/year (USD)	49,000
<ul style="list-style-type: none"> 185 employees Milk processing capacity of 25,000 tons per year 		<ul style="list-style-type: none"> 548 permanent employees Sales of 1,2 million ton HRC/annum 		Energy Savings/year (MWh)	774
				Cost of initiative (USD)	0
				Payback Period	0
				ton CO ₂ savings/year	742

Fig. 8. Examples of results of EnMS and ESO implementation in UNIDO partner enterprises.

Output 2.4 Five (5) enterprises from key Macedonian industrial sectors develop and implement integrated Energy and Environment Management Systems in line with ISO 50001 and ISO 14001

This output aims to generate further national experiences, case studies and expertise with regard to the implementation of EnMS/ISO 50001 in industry and the provision of related market/consultancy services. The rationale of this output is two-fold:

1. Evidence from USA and Europe experience, confirmed also by findings of few surveys carried out by UNIDO since 2008, shows that for the vast majority of industrial companies, environmental management systems did and do not provide a suitable framework to ensure good energy management and energy performance. Mainly because of this evidence, USA, Europe, Brazil, China and many other countries decided that an Energy Management System Standard was needed and strongly supported the development of ISO 50001.
2. One of the areas where many companies that implemented EnMS standards indicated as difficult, across countries, was/is that of integration of EnMS/ISO 50001 with other management systems. Discussion with Macedonian enterprises confirmed the relevance of such concern and problem, with some of the prospective partner enterprises of the project also raising questions about practices and solutions.

This output will be pursued through the provision of additional local expert support to 2-3 partner enterprises of the EnMS Expert training program that already have an Environment Management System in line with ISO 14001 and that are interested in integrating ISO 50001 and ISO 14001. In addition to these 2-3 partner enterprises, the project will provide expert technical assistance to 2-3 new enterprises with ISO 14001 in place for the implementation of EnMS-ISO 50001. The PPG survey carried out together with the Energy Agency showed that there are a number of large or medium-size energy intensive Macedonian companies that are not prospective partner enterprises for the EnMS Expert training program and which have got already an environment management system in line with ISO 14001.

Output 2.5 Top management of at least 50 enterprises understands the economic and environmental benefits of energy efficiency and is made aware of key relevant commercial best-available practices and technologies (i.e. EnMS and ESO)

This output aims to promote EnMS and ESO to a larger audience of industrial enterprises and to generate additional new demand for expert support services, both in terms of training and technical assistance for implementation.

This output will be achieved through a series of ½ day seminars focused on energy management systems and energy system optimization (ESO) and targeted to enterprises' top management, managers and other relevant interested participants.

This ½ day seminar is designed as an introduction to the topic of energy management for factory managers and as a networking opportunity. The seminar will be presented in the language of management and speaks to issues such as the role of energy management and energy efficiency in improving bottom line and competitiveness; meeting national or international legislation requirements as well as climate change targets; enhancing prospects for new market access and for international trade. The seminar will present national and international case studies as well as the range of training, technical and financial assistance that the UNIDO-GEF project would make available to Macedonian companies.

The series of seminars will take place mainly after the completion of the EnMS-CASO-SSO EXPERT Training Programs, so that these seminars will be delivered, to a good extent, by the national consultants that will have been trained and qualified by the UNIDO-GEF project. Managers and representatives of national partner enterprises that will have implemented EnMS and/or ESO projects will also participate as speakers.

The seminars will be organized by the REC Macedonia in close collaboration with the Macedonian Chamber of Commerce and Industry. Some of the seminars will be jointly organized with the USAID – Industrial Energy Management Project.

Output 2.6 Personnel of fifty (50) enterprises receive training on the implementation of energy management systems and energy system optimization measures

This output makes a contribution to address the substantial knowledge and capacity gap between industrial enterprises' managers and engineers for energy management and energy efficiency. Through the provision of techniques/technology focused training, Output 2.6 aims to enable enterprises' managers and engineers to develop plans and

initiate actions for improved energy management and energy performance of steam systems and compressed-air systems.

2-day EnMS Implementation Training

The 2-day EnMS training is targeted to enterprises staff that within their organization have responsibilities for energy management. The training guides participants through the Plan-Do-Check-Act cycle as it applies to the implementation of energy management systems in line with ISO 50001. Instructions, templates and tools to initiate and support the implementation of effective energy management systems will be provided and demonstrated, including how to develop an energy policy, review energy uses, identify what is significant, establish a baseline, develop energy performance indicators, identify opportunities for improvement, set objectives and targets, and much more.

The objective of the training is to enable enterprises to start the implementation of an EnMS. At the end of the training enterprises staff is expected to:

- a. Understand all elements of energy management systems in line with ISO 50001 and the use of the tools provided by UNIDO to support implementation;
- b. Be able to put together a high-level project management plan (time, resources, costs, etc.) to implement an EnMS;
- c. Be able to report back to their top management on the EnMS and its benefits.

A series of 4-5 trainings, with 25-35 participants each, is planned; two of them will be jointly-organized with the USAID Industrial Energy Management Program. Trainings will be delivered by a team of international and national EnMS trainers, with the national EnMS trainers taking progressively more and more responsibility. The last 1-2 trainings will be entirely delivered by the UNIDO qualified national EnMS Experts.

It is to mention that UNIDO and the USAID Industrial Energy Management (IEM) Project have already started to collaborate for the delivery of joint 2-day EnMS training to enterprises. In July 2013 UNIDO and the USAID IEM Project held a 3 days closed EnMS expert group meeting (EGM) during which respective programs were presented in full details. The EGM allowed highlight and fully understand the great complementarities of the two approaches/programs as well as the potential duplications. Based on such understanding, opportunities for collaboration and joint-activities to increase impact and coherence of the two programs were discussed and agreed. A key joint-activity that was agreed is the organization and delivery of joint UNIDO-USAID/IEM 2-day EnMS implementation training to Macedonian enterprises participating in the USAID IEM Project. The curriculum of such training relies for 75% on UNIDO material and 25% on USAID-IEM material. The “UNIDO Practical Guide for Implementing an EnMS” and its related implementation supporting tools were provided to the USAID-IEM Project for translation and distribution to its partner enterprises.

2-day CASO Training and 2-day SSO Training

The 2-day Compressed-Air System Optimization (CASO) training is targeted at facility engineers, operators and maintenance staff of enterprises and at energy service providers. It is designed to introduce CASO, describe the value of CASO, to teach participants how to qualitatively assess compressed-air systems performance and cost, identify potential improvement opportunities and achieve cost savings through proper operation and controls, system maintenance, and appropriate uses of compressed-air. The 2-day training introduces also basic principles for energy efficient design of compressed-air systems, how to successfully sell CASO projects to management and how to select a CASO service provider. The 2-day Steam System Optimization (SSO) training follows the same approach and structure.

The objective of these trainings is to enable enterprises’ engineers/staff and other participants to identify system optimization opportunities and develop and implement them with no (easy ones) or limited outside assistance.

Series of 3 trainings on CASO and 3 training on SSO, each with 20-30 participants, are planned. Trainings will be delivered by UNIDO international CASO/SSO experts and UNIDO qualified national CASO/SSO experts. The training will be promoted and organized together with key relevant partners and institutions that have the mandate or a strong interest to continue offering such type of market services to industrial enterprise and other large energy consumers.

All these 2-day trainings will be organized by the REC Macedonia in close collaboration with the Macedonian Chamber of Commerce and Industry, the USAID-IEM Project, the Faculty of Mechanical Engineering, the Faculty of Technology and UNIDO National Cleaner Production Centre.

The key activities under Output 2.6 will be:

- i. Preparing training curricula, material and tools (in Macedonian)
UNIDO will contribute most of the training content from its existing knowledge and training assets. The Faculty of Mechanical Engineering, the NCPC and the USAID IEM will contribute resources towards the fine tuning of the material and its translation in Macedonian.
- ii. Promoting the training between enterprises
REC Macedonia will closely work with Macedonian Chamber of Commerce and Industry, the NCPC and energy efficiency professionals to lever their networks and to reach out their associates and clients.
- iii. Ensuring timely preparation of training logistics and delivery
REC Macedonia Office will work with the Macedonian Chamber of Commerce and Industry, the NCPC and the Faculty of Mechanical Engineering and the Faculty of Technology.

In order to ensure further dissemination of the EnMS and ESO USER trainings as well as wider provision of expert technical support services to enterprises after project completion, as mentioned earlier in Output 2.1, all trainees that will successfully complete the EXPERT programs will be licensed also the use of the USER training material for further delivery to enterprises and other interested or potential target energy consumers/clients such as utilities, commercial buildings, transport companies and others. In addition to that, the project will ensure the transfer of the USER training programs also to one or more institutions such as the Macedonian Chamber of Commerce, the Faculty of Mechanical Engineering, the Faculty of Technology and the National Cleaner Production Centre.

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

Component 3 wants to enhance the use of available financing facilities for investments in industrial EE as well as to help mobilize additional financing from the Macedonian banking sector.

Output 3.1 Technical Assistance Facility to support IEE investments is developed and established

The UNIDO-GEF project will work with the Macedonian Bank for Development Promotion (MBDP) to establish a Technical Assistance (TA) Facility that can mitigate the following barriers:

- i. the limited or lack of resources of enterprises to prepare “satisfactory” IEE investment proposals for loans application;
- ii. the limited or lack of technical capacity and the higher transaction costs for Macedonian banks to appraise IEE investments/loans applications;

The TA Facility will be accessible to both individual enterprises and commercial banks and it will provide cost-free expert technical assistance for the following activities:

- ✓ Preparation of IEE investment proposals for loan application.
The value of the expert technical assistance provided will not be higher than 2.5% of the total project costs and up to a maximum of 4,000 USD per proposal or enterprise.

- ✓ Technical due-diligence/appraisal of IEE investment proposals submitted to Macedonian commercial banks that have access to existing credit lines for or open to IEE administered by MBDP.
The value of the expert technical assistance provided will not exceed 1.5% of the total project/investment value and up to a maximum of 1,500 USD per investment or enterprise.

The technical assistance support will be provided by “Accredited EE Consultants” that will be selected by the UNIDO-GEF project in collaboration with MBDP and local commercial banks.

The reduction of the transaction costs of local commercial banks in appraising IEE loan applications is a key purpose of the TA Facility and a key driver for banks’ engagement with the TA Facility and with IEE investments in general. Over time transaction costs decrease as result of greater confidence and ability in appraising EE projects and associated risks, greater standardization of the appraisal routines and increasing efficiency of the overall transaction process. Interest of local banks in the TA Facility will be stronger if they will have the certainty or clearly see the likely possibility of “re-using” the appraising knowledge and experience acquired through the use of the TA Facility, in other words if they will see the opportunity of issuing other loans of the same or very similar type.

In the light of these considerations and taking into account both the limited resources available to the project and the number of local banks that will potentially use the TA Facility (5 is the minimum target) it is envisaged to focus the TA Facility on a limited set of IEE cross-cutting technologies that usually involve low-medium capital intensive projects, that present low risks in terms of energy efficiency/saving performance and for which there would be meaningful or substantial replication and market potential (i.e. steam boilers and systems, compressors and systems, motors plus variable speed drives, energy metering equipment, insulation and few others).

The TA Facility will become operational only during the second year of the project implementation in order to benefit also from the pipeline of EE projects/investments identified as result of the capacity building for and implementation of energy management systems and energy system optimization assessments carried out under Component 2. Starting the TA Facility during the second year will also allow analyze further the technological focus of the TA Facility and finalize it in consultation with MBDP and local commercial banks.

The TA Facility has been proposed and designed with the assumption and the vision of a progressive integration of EE in enterprises’ investments planning and decision-making on the one hand, and on the other of a progressive integration of IEE projects in the loans/products portfolios of local commercial banks. Considering that the TA Facility is viewed as a short-lived IEE-investment-market accelerator intervention. Having said that, it is likely that by the end of the UNIDO-GEF project implementation period the envisioned scenario will have not fully materialized and an extension or replication of the TA Facility or similar mechanism might be beneficial and/or needed. For this reason the UNIDO-GEF project and the MBDP will work together to mobilize additional resources to sustain the operation of the/a TA Facility, once proved effective in increasing the rate of IEE investments made/loans issued compared to a baseline scenario without TA Facility. The success and demonstrated impact of this pilot TA Facility will enable the Macedonian Bank for Development Promotion to build a stronger case vis-à-vis the Government, especially, and IFIs for having TA components attached to existing or future credit lines for non-traditional and non-mainstream type of investments.

The TA Facility will be administered by the MBDP with the technical support of REC Macedonia and UNIDO NCPC. During the first year of project implementation the design of the TA Facility will be finalized, taking also into account inputs of a larger number of local commercial banks.

The key activities under Output 3.1 will be:

- i. Setting up the TA Facility
This will require the MBDP and the UNIDO-GEF project team to hold consultations with local commercial banks, prepare collaboration agreements, finalize the application process and develop relevant templates and documents (which will be kept as simple as possible), define the qualification requirements for the Accredited EE Consultants, transfer the funds to the MBDP.
- ii. Promoting the TA Facility

The MBDP will take the lead in promoting the TA Facility between local banks; the UNIDO-GEF project team will work with the Chamber of Commerce and Industry, the UNIDO NCPC and the local energy efficiency professionals to reach out to enterprises.

iii. Operating TA Facility

The MBDP will administer the TA Facility with technical support from the REC Macedonia & UNIDO NCPC.

Output 3.2 At least 15 local EE consultants trained in IEE investments preparation

This output is a complementary integral part of the TA Facility. The objectives of this output are:

- a. To enhance capacity of local IEE consultants to prepare higher-quality IEE investment proposals for submission to local commercial banks for loan applications;
- b. To promote the TA Facility and ensure the highest possible productive/successful use of its funding;

A training program of 2-3 days will be developed on best-practices for the preparation of IEE investment proposals for submission to international and national financial institutions. The training curriculum will be developed with the involvement of officials from local banks as well as IFIs operating in Macedonia to ensure strong alignment with the requirements and needs of the local financing sector. Selected representatives of MBDP and commercial banks will participate in the development of the training curriculum and as speakers/trainers together with national and international financing experts. The training will also present the TA Facility, its procedures, templates and application process. Attendance of the full training will be a requirement to become eligible for the role of “Accredited EE Consultant”.

It is to mention that while trainings under Component 2 provides only some knowledge and basic skills for carrying out initial costs-benefits analysis (payback period and internal rate of return) of energy savings and efficiency improvement opportunities, the training to be provided under Output 3.2 would specifically focus on detailed financial analysis of IEE projects and on the preparation of high-quality IEE investment/project proposals for loans application to local banks. The IEE financing knowledge, competencies and tools to be provided through Output 3.2 training will be largely different and complementary to those of Component 2 trainings.

It is further anticipated that Output 3.2 training will take place after completion of the Component 2 training programmes and the project will encourage national consultants that will have successfully completed the EnMS, SSO and CASO EXPERT training to attend the training on IEE investment proposal preparation. The reason for doing that would be that of having a good number of IEE (in particular SSO, CASO or EnMS) consultants that would be able to take care of the whole IEE project/investment development process: from the identification stage, through the engineering design, to the final loan application; offering to enterprises the option of a “one-stop shop”.

The project will ensure that all enterprises benefiting from project Component 2 training and technical assistance will be informed about name of national consultants that will have successfully completed the EnMS, SSO and CASO Expert trainings and the training on IEE investment proposal preparation. The list of all national consultants “qualified” by the UNIDO-GEF project will be made available to the larger enterprises population through the website of the National IEE Best Practice Information and Dissemination Program.

The training program on IEE investment proposal preparation will be developed and organized by the project management unit (PMU) with the collaboration and support of the Macedonian Bank for Development Promotion.

In case there should be high demand for participation in the training, the project will discuss with MBDP, Government counterparts and other project partners the possibility of delivering an additional training to be partially or entirely funded through participation fees. The training curriculum and relevant material will be licensed for free to the MBDP and other qualified organizations, after consultations and in agreement with project counterparts.

Output 3.3 At least 15 bank lending officers trained in assessing IEE investments proposals

This output aims to complement the TA Facility in addressing the lack or limited capacity of lending officers of local banks in appraising IEE investment/project proposals. The objectives of the output are:

- a. To enhance the ability of lending officers to properly assess IEE investment/project proposals, with consequent positive impact on the loan securitization requirements and ultimate projects' viability;
- b. To promote the TA Facility and ensure its widest and greatest possible use by local banks;
- c. To increase the number of loans issued by local banks for IEE projects/investments.

A training program of 2-3 days will be developed to build better lending officers' understanding of IEE projects/investments (from a banking sector/lending officer perspective) and operational capacity and skills to appraise proposals and identify/assess risks with reference to a limited number of specific but rather common IEE technologies and type of projects (renovation of auxiliary energy systems/services such as steam systems, compressed-air systems, pumps system and other technologies with clear replication and market potential). The training will also present the TA Facility, its procedures, templates and application process. Attendance of the full training will be a requirement for commercial banks interested in having access to the TA Facility.

The training curriculum will be developed with the involvement of international and national lending officers and national leading EE consultants. Equipment suppliers relevant to the selected types of IEE investments/projects to focus on will be also offered space and time to briefly present their market segments.

The organization of the training program will be responsibility of the PMU with the technical collaboration and support of the MBDP.

In case there should be high demand for participation in the training, the project will discuss with MBDP, Government counterparts and other project partners the possibility of delivering an additional training to be partially or entirely funded through participation fees. The training curriculum and relevant material will be licensed for free to the MBDP and other qualified organization, after consultations and in agreement with project counterparts.

Output 3.4 Performance-based Financial Reward mechanism for IEE investment projects established

This output aims to provide a financial incentive to enterprises to invest more in and prioritize IEE projects while at the same time ensuring greater enterprises' management and technical attention to the energy savings/GHG emission reduction performance of the implemented IEE projects.

Most Macedonian enterprises are facing serious financial resource constraints, also as a result of the recent global financial crisis. Even though several credit lines that offer special conditions (lower and/or fixed interest rates; longer loan tenures; grace periods) for EE/RE/green technology investments/loans are available, for many companies and especially SMEs, such financing terms are still perceived or considered as not sufficiently attractive to take the "risk" of an IEE investment.

Looking at the positive results of the regional pilot EBRD WeBSEFF program and based on the feedback of enterprises and stakeholders, the MBDP and other Macedonian commercial banks believe that the prospect of a post-implementation reward in the form of a cash refund/contribution would be critical for many of these companies in overcoming their reluctance and deciding to invest in/prioritize IEE projects and access one of the existing credit lines available to local banks.

The Performance-based Financial Reward (PbFR) mechanism will be established by the GEF-UNIDO Project together with the Macedonian Bank for Development Promotion. MBDP is currently administering two credit lines: 1) the Credit Line for SMEs and Priority Projects (funds from the European Investment Bank), accessible to 11 Macedonian commercial banks; 2) the Financing Sustainable Energy Projects Credits Line (funds from the World Bank), accessible to 5 Macedonian commercial banks.

The PbFR mechanism will provide a cash reward/premium to those enterprises that will have successfully completed their IEE projects, implemented using one of the credit lines administered by MBDP, where success will be determined by the achievement of quantitative performance targets (efficiency gains or energy savings) set and agreed before the issuance of the loan and the project implementation.

All commercial banks with access to the MBDP administered credit lines would be entitled to use the PbFR mechanism. Based on substantial discussion between the UNIDO-GEF project team and MBDP colleagues an initial design of the PbFR mechanism was developed, which consists of the following steps:

1. Commercial banks submit IEE investment/project proposals to MBDP to apply for the PbFR incentive;
2. A technical assessment of the IEE investment/project proposal and its expected energy and GHG emission savings is carried out by UNIDO-MBDP expert;
3. If the IEE investment/project is technically cleared (i.e. it meets performance criteria/targets), a UNIDO-MBDP accredited expert¹⁴ will discuss, define and agree with the enterprise the Measuring and Verification methodology to be used, when to carry out the baseline assessment and the verification of performance improvement achieved;
4. A standard letter of agreement, with the methodology agreed as annex, is submitted by the enterprise to MBDP for clearance/signing;
5. MBDP issues a letter/statement of clearance to the commercial bank that the submitted IEE investment/project is eligible for the PbFR;
6. The commercial bank issues the loan to the enterprise;
7. The enterprise implements the IEE project;
8. At the agreed time, the energy and GHG emission performance of the implemented IEE project are verified by a UNIDO-MBDP Verifier¹⁵. The cost is covered by the incentive program.
9. Within 15 working days the Verifier submits a report to the enterprise and to the MBDP.
10. In case of successful achievement of performance targets, MBDP transfers within 10 working days the PbFR (i.e. cash premium) to the enterprise.
11. In case of un-successful achievement of performance targets, the applicable process needs to be defined.

As for the cost/financial structure of the Performance-based Financial Reward mechanism, Table 8 shows the structure discussed and tentatively agreed with the MBDP.

¹⁴ The UNIDO-MBDP expert would have to be a local EE consultant that is a Certified Measurement & Verification Professional (CMVP) with experience in using IPMVP methodologies. Few local CMVP certified consultants have been already identified during the PPG phase.

¹⁵ The UNIDO-MBDP Verifier would have to be a local EE consultant that is a Certified Measurement & Verification Professional (CMVP) with experience in using IPMVP methodologies. Few local CMVP certified consultants have been already identified during the PPG phase.

Table 8 – Tentative cost/financial structure of the Performance-based Financial Reward mechanism

Element	Description
Cash premium for Enterprises	7-8% of loan principal up to a maximum of 30,000 USD per loan/enterprise
Transaction costs subsidy for local banks	250 USD for IEE investments/loans between 50,000 - 100,000 USD 500 USD for IEE investments/loans between 100,000 - 200,000 USD 1000 USD for IEE investments/loans above 200,000 USD
Cost of ex-ante M&V	1,000 USD
Cost of ex-post M&V	2-3,000 USD
MBDP Operation Costs Support	10,000 USD

The PbFR mechanism will become operational during the second year of project implementation in order to benefit from the pipeline of EE projects/investments identified and developed as result of Component 2 activities as well as of IEE project development activities carried out within the scope of the USAID Industrial Energy Management project and the UNIDO Low Carbon Production in the Agro-Industry project. During the first year of project implementation the UNIDO-GEF project team and the MBDP will work to finalize the design and to set up the PbFR mechanism.

Likewise the TA Facility, the PbFR mechanism is viewed as short-lived IEE-investment-market accelerator intervention aimed to attract greater enterprises' as well as local banks' attention towards IEE investments and further build their capacity and confidence in lending for IEE. Once the PbFR operated by the MBDP will have proved to be effective in increasing the rate of IEE investments made/loans issued, the UNIDO-GEF project and the MBDP will work together to mobilize additional grant/donors' resources to sustain the financial reward element of the PbFR mechanism. The success and demonstrated impact of the PbFR will be also used by the UNIDO-GEF project and the MBDP to engage in discussion with the Government about the possibility to convert the financial reward in a fiscal reward.

Global Environmental Benefits

Each project component will make an impact, either directly or indirectly, on Macedonian industrial energy consumption, use and GHG emissions. The project is expected to generate cumulative direct GHG emission reductions in the range of 67,000 - 76,000 ton CO_{2eq} and indirect GHG emission reductions in the range of 66,000 and 72,000 ton CO_{2eq}. Direct and indirect GHG emission savings have been estimated taking into account a 10 year and 7 year investment life-time for EnMS and ESO respectively.

Direct energy savings and GHG emission reductions will be generated through:

- a. The implementation of energy management systems and energy system optimization projects in partner enterprises participating in the full EnMS and ESO programs to be executed under Component 2;
- b. The energy efficiency investments made and loans issued as result of the TA Facility and Performance-based Financial Reward mechanism set up under Component 3;

Indirect energy savings and GHG emission reductions will be the result of:

- a. The regulation, incentives and supporting programs for EnMS and IEE established under Component 1;
- b. The enhanced expertise, skills, tools and overall industrial energy efficiency service offer of local EE consultants trained by and participating in the EnMS and ESO programs and activities under Component 2 and Component 3;

- c. The training on EnMS and ESO delivered to top management and staff of the additional 50 enterprises under Component 2;
- d. The greater experience and confidence of commercial banks' officers in lending for IEE investments, especially for selected type of investments that will be supported and promoted by the project;
- e. The enhanced capacity for preparation and better quality of IEE projects/investments proposals by local EE consultants

Annex H provides a detailed description of the methodology used and assumption made to estimate the project direct and indirect emission reductions.

Differences between the Project Framework of the Request for CEO Endorsement and that of the Approved PIF

PIF Output 1.1. National Energy Management System Standard compatible with ISO 50001 is adopted and promulgated

This output is no longer relevant since the National Standard Authority of Macedonia already adopted ISO 50001 as Macedonian energy management system standard.

PIF Output 1.2. Secondary legislation (i.e. by laws) for energy efficient and green industry is developed (and adopted), including introduction of energy efficiency performance indicators linked to ISO 50001 in the national protocol for Integrated Prevention and Pollution Control (IPPC) for industry

During the PPG phase a detail assessment of the current national protocol for Integrated Prevention and Pollution Control (IPPC) for industry was carried out. The legal and regulatory framework of the Macedonian IPPC protocol was analyzed together with a review of the associated institutional infrastructure in terms of staffing, expertise, reporting requirements, resources for inspection and enforcement, penalties and fees. The analysis looked also in details to the policy-making and legislation-developing process that would be required by several regulatory intervention options. The findings of the analysis were presented to the Ministry of Environment and the identified possible interventions and their implications were discussed.

The shared conclusion reached by UNIDO and the Ministry of Environment on the basis of the analysis and discussion was that modifying the existing IPPC protocol and relevant requirements would not only be too burdensome under the current Macedonian circumstances, but it would also not ensure the delivery of tangible incremental environmental/GHG emission reduction benefits in the short- or medium-term.

Major problems identified included:

- i. The complexity of modifying the existing very articulated legal and regulatory framework and associated infrastructure of the Macedonian IPPC protocol/platform;
- ii. The serious human resources and expertise constraints already faced by State Environmental Inspectorate (SEI) of the Ministry of Environment and the Municipalities in dealing with the existing set of required inspective and monitoring functions;
- iii. The lengthy process required for getting Permits granted and few legal disputes between the Ministry of Environment and enterprises that originated from and contributed to that;
- iv. The existence of a 20% discount on A-IPPC Permits and 15% on B-IPPC Permits annual charges for enterprises certified to ISO 14001 that would not allow any provision of similar/further incentives for ISO 50001 implementation/certification.

PIF Output 1.3. Framework (methodology and institutional set up) for Monitoring, Reporting and Verification of energy efficiency and GHG emissions performance of industrial enterprises is developed and tested

During the PPG phase two new donor-funded programs aimed to support the Ministry of Economy, the Energy Agency and the National Office of Statistics in improving the national institutional capacity and framework for Monitoring, Reporting and Verification of energy performance and indicators were initiated: the USAID Low Emissions Development and Clean Energy Investment (LED-CEI) project and the GIZ Monitoring and Verification Platform project

In the light of such developments, after review of the resources available to the projects and consultations with the Ministry of Environment and other counterparts, the PIF Output 1.3 as initially envisaged was deemed redundant and it was decided to look into a possible alternative output/intervention that could build on and add value to the USAID and GIZ work.

Through discussions with the Ministry of Environment, the Ministry of Economy and stakeholders such alternative output/intervention was identified in the development of an “Industrial Energy Data Management Framework/Map” on the basis of the following considerations and rationale:

- i. In 2013 the Macedonian Government, through its Ministry of Environment and with the financial support of the Norwegian Government, started to take steps towards a future participation of Macedonian large and energy intensive industrial enterprises in the EU Emission Trading Scheme (ETS). A key aspect of the EU ETS operations is that the allocation of CO₂ allowances is based on specific benchmarks. As a consequence, in order to join the EU ETS, Macedonian Government/institutions and relevant enterprises will have to be able to do rigorous benchmarking of energy and carbon emission performance. Based on discussion with counterparts and further analysis, it was found out that knowledge, expertise and experience on energy performance/ efficiency benchmarking is largely lacking within Government institutions and it is also fairly limited within potential EU ETS-eligible enterprises.
- ii. The proposed UNIDO-GEF project has a strong focus on promoting and supporting the implementation in industry of energy management systems (EnMS) in line with ISO 50001, especially in large energy intensive enterprises; the project will work with and assist directly some of the Macedonian companies that in the future would/will be part of the EU ETS. Now, the implementation of EnMS in line with ISO 50001 requires organizations to introduce a strict discipline of data collection, analysis and management. The evidence from EU countries with an EnMS standard history shows that the energy data collected by enterprises within the scope of their energy management systems cover almost entirely (80-90%) the data collection requirements to be fulfilled for the EU ETS benchmarking and reporting purposes.

Taking the above two points into account, it was decided to replace Output 1.3 of the originally approved PIF with Output 1.5 of the present Request for CEO Endorsement, i.e. with the development of an Industrial Energy Data Management Framework/Map which would establish explicit correlation and links between the data requirements of EnMS-ISO50001, the EU ETS benchmarking requirements and the requirements for the national MRV framework.

PIF Output 1.6. Certification program for Energy Auditors developed

During the PPG phase the Ministry of Economy and the Macedonian Government have made major progress with the development of the planned certification program for Energy Auditors. Thanks also to new donor’s support provided, a relevant Rulebook was developed and the Energy Law amended. The first certification course is expected to take place in 2014. Considering such developments, the PIF Output 1.6 was deemed no longer relevant and it was decided to look into possible alternative output/intervention.

In the light of the strong focus of the Second NEEAP on energy management in the Public, Commercial and Industrial sector, the consequent large target group of potential users/implementers and the very limited knowledge and capacity

for energy management within all sectors, it was decided to develop a Certification Program for Energy Management Practitioner that on the one hand would lever and supplement the EnMS market development work of the GEF-UNIDO and USAID projects and on the other would complement and be supported by the introduction of a legal/regulatory requirement for large industrial and public sector energy consumers to have a certified Energy Management Practitioner, i.e. Output 1.1 in the present Request for CEO Endorsement.

PIF Output 3.1. Two-three selected energy efficiency/low carbon lighthouse projects are implemented in key energy intensive industrial sectors

Further discussions with counterparts and financing institutions held during the PPG phase led to the decision of focusing PPG's attention and resources on the identification and development of incentive/supporting mechanism for existing financing facilities for or open to IEE investments. The decision was based on the following findings:

- ✓ Given the GEF resources available, to establish an incentive/supporting mechanism for existing financing facilities for industrial EE and at the same time supporting few energy efficiency/low carbon lighthouse projects would have not been feasible;
- ✓ National legislation on direct State financial aid would have required a competitive and resource-demanding process for the selection of the lighthouse project;
- ✓ Enhancing existing financing facilities was deemed offering greater potential impact on the local IEE investments market in view of the strong interest of local commercial banks and financing institutions.

PIF Output 3.2. Mechanism to enhance mobilization and disbursement of available commercial financing for energy efficiency and low-carbon technology investments is introduced

This Output has been basically maintained and just further articulated in this Request for CEO Endorsement. At the PIF stage the USAID loan guarantee mechanism (Development Credit Authority – DCA – facility) for small and medium sized enterprises and the credit schemes of the Macedonian Bank for Development Promotion had been identified as financing facilities to be potentially complemented.

During the PPG phase substantial discussion took place with USAID Macedonia to further analyze the feasibility of complementing the USAID loan guarantee mechanism with a GEF-UNIDO technical assistance and/or performance based incentive mechanism. The GEF-UNIDO project team held discussions also with the two local banks that have access to the USAID DCA facility, UNI Bank and NLB Leasing. Based on all those meetings and further analysis, it was conclude that a formal agreement and collaboration with the USAID DCA facility was not feasible due to the very burdensome administrative process that it would require. But in addition to that, the fact that basically only one local bank is making use of the USAID DCA facility was considered not a desirable scenario, since benefits of the GEF-UNIDO support would have mainly accrued with just one local bank. Discussion then started with the Macedonian Bank for Development Promotion, which currently administers two credit lines accessible to 11 and 5 local banks respectively, and continued until the definition of the current project Component 3

A. 6. Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:

Table 9 – Risks and mitigation measures.

Risk	Level	Mitigation Measures
<p>Institutional Coordination between key ministries and institutional stakeholders is loose and insufficient to ensure target impact</p>	Moderate	<p>This risk will be mitigated by:</p> <ul style="list-style-type: none"> (i) Participation of all key Government counterparts, institutions and stakeholders associations in the Project Advisory Committee to establish the institutional linkages among stakeholders; (ii) Thematic/output-based working groups with participation and representation of key relevant stakeholders; (iii) Clear definition of roles and responsibilities, continuous monitoring and support by the Project Management Unit (PMU) and periodic reporting to the Cabinet of the Vice Prime Minister.
<p>Policy and Regulatory Proposed policies, regulations and programs are not adequately adopted and implemented; weakening of political commitment.</p>	Moderate	<p>This risk will be mitigated by:</p> <ul style="list-style-type: none"> (i) Macedonia obligation under the Energy Community Treaty to implement National Energy Efficiency Action Plans and the inclusion in these Plans of specific measures/actions for the industry sector that are explicitly focusing and calling for the technology solutions promoted and supported by the project; (ii) Engaging Government decision makers in thematic/output-based working groups to build their IEE understanding and keep them involved; (iii) Provide regular communication and reporting of project implementation progress and offer opportunities for high-visibility; (iv) Carefully designing and providing capacity building programs tailored to policy-makers and institutional specific needs; (v) Establish close dialogue with key energy donors to ensure coordination and promote synergies and continuity between ongoing technical assistance efforts and future initiatives.
<p>Technological Companies and EE service providers fail to fully understand the technical/ business opportunities and potential benefits of implementing energy management systems and energy systems optimization projects.</p>	Low	<p>This risk will be mitigated by:</p> <ul style="list-style-type: none"> (i) Clear understanding by target beneficiaries of EnMS, ESO and the project built during project preparation and consolidated during project implementation; (ii) Preparing effective information and awareness raising packages; (iii) Tailoring the project capacity building programs to the context and culture of Macedonian industrial enterprises and consultants, setting clearly defined learning and action outputs and outcomes; (iv) Setting up intermediate performance indicators to monitor, verify and report on progress.

<p>Market risk Industry decision-makers do not participate and engage actively in the project</p>	<p>Low</p>	<p>This risk will be mitigated by:</p> <ul style="list-style-type: none"> (i) High and rising energy prices that will continue to put pressure on enterprises for energy costs reduction; (ii) Existing and forthcoming regulatory requirements for or related to energy efficiency and energy management (i.e. the electricity market liberalization and associated balancing system requirements and the energy management plan requirement under the IPPC protocol as for existing obligations); (iii) Development and delivery of tailored information and promotional campaigns, including awareness raising and networking events, in collaboration with key recognized national industrial associations.
<p>Economic and Financial After EnMS implementation and energy systems optimization assessments and reports, enterprises may not be willing or able to invest in energy efficiency projects and technologies, even if energy saving potential is important</p>	<p>Moderate</p>	<p>This risk will be mitigated by:</p> <ul style="list-style-type: none"> (i) Providing training to enterprises' key personnel to build their capacity to understand the economic and financial value of investing in energy management and energy systems optimization; (ii) Providing EE procurement and cost-benefits analysis routines as integral part of the EnMS and ESO training; (iii) Providing a critical mass of demonstration cases/ success stories with the help of technical assistance for project preparation and financial incentives to generate enterprises' confidence in the economic and financial returns of IEE investments; (iv) Enhancing promotion, marketing and understanding of existing financing facilities terms and conditions.
<p>Climate Change</p>	<p>Not Applicable</p>	<p>Based on discussion with stakeholders and analysis of relevant past information, no tangible impact of Climate Change on Macedonian industries has been reported.</p>

A. 7. Coordination with other relevant GEF financed initiatives

During the PPG phase the achievements of and lessons learned from the GEF project “Sustainable Energy Program” implemented by IBRD (GEF ID 2531) have been analysed and will be taken into account during implementation of the present project. Although the IBRD project focused more on renewable energy and on the public sector, UNIDO-GEF project will take into account and build on the increased capacity of the Macedonian Bank for Development and Promotion for sustainable energy financing. The local EE consultants and commercial bank lending officers that benefited from the IBRD project will be invited to participate in the IEE investments trainings of Component 3 in order to further strengthen capacity and scale-up investments for sustainable energy with a focus on EE in industry.

Other GEF financed project in the area of climate change is the enabling activity project “Macedonia's First Biennial Update Report” (GEF ID 5369) implemented by UNDP to assist Macedonia fulfill its obligations under the United Nations Framework Convention on Climate Change. The UNIDO-GEF project will liaise with the UNDP project, to ensure that coordination and synergies, where needed or possible, are captured.

The project will coordinate and where feasible collaborate with the ongoing GEF-UNIDO POPs project “Removal of Technical and Economic Barriers to Initiating the Clean-up Activities for Alpha-HCH, Beta-HCH and Lindane Contaminated Sites at OHIS” (GEF ID 4385). Possible synergies that are anticipated and that will be explored during project implementation relate to the capacity building activities of the two projects and the work to identify and prioritize best-available practices and technologies for environmental management (i.e. POPs in 4385) and for climate change

mitigation in industry (in the present project through the proposed technology needs and opportunities assessment for the Macedonian manufacturing sector).

UNIDO will also ensure coordination, where relevant, with current and upcoming climate change national and regional initiatives of other GEF Agencies, such as UNEP and UNDP.

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

B. 1. Describe how the stakeholders will be engaged in project implementation.

As for the project implementation arrangement, UNIDO holds the ultimate responsibility for the implementation of the project, the delivery of the planned outputs and the achievement of the expected outcomes. The project will be executed by the Ministry of Environment and Physical Planning, (MEPP), the Ministry of Economy (ME), the Energy Agency of the Republic of Macedonia (EARM) and the Regional Environmental Centre for Central and Eastern Europe – Country Office Macedonia (REC Macedonia) in collaboration with UNIDO.

UNIDO will be responsible for the overall management and monitoring of the project, and reporting on the project performance to the GEF. Taking into account discussions with partners and their capacity constraints with respect to networks and reach out of international experts in the project targeted technologies, UNIDO will be also in charge of procuring most of the international expertise needed to deliver the outputs planned under the three project components. It will supervise and monitor the work of the international teams and ensure that deliverables are technically sound and consistent with the requirements of the project.

The MEPP will be the Government institution responsible for the overall national project intendance and the coordination of Government institutions' work; together with the ME and the EARM will be leading and overseeing most of the substantive work to be performed under Project Component 1. Contractual arrangements will be made between the project and the EARM for the conduction of a number of activities under project component 1.

A Project Management Unit (PMU) will be established within the Regional Environmental Centre for Central and Eastern Europe – Country Office Macedonia (REC Macedonia). The PMU will consist of the National Project Manager (NPM) and the Project Administrative Assistant (PAA). The PMU will be responsible for the day-to-day management, monitoring and evaluation of project activities as per an agreed project work plan. In close collaboration with the MEPP, ME and EARM, the PMU will be responsible for the overall coordination of project activities carried out by international and national experts and partners. It will also be in charge of the organization of the various seminars and trainings to be carried out under Project Component 2. The PMU will be funded by the project management costand by REC Macedonia's in-kind contributions and UNIDO co-funding. Contractual arrangements will be made between the project and REC Macedonia also for procuring the national services and expertise required for activities under project components 1,2 and 3. During the whole implementation period of the project UNIDO will provide the PMU with the necessary management, technical and monitoring support. For the contractual arrangements with the REC Macedonia as well as with other project executing partners, UNIDO's rules and regulations will apply.

A Project Advisory Committee (PAC) will be 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 will have a balanced representation from key ministries, public institutions, private sector, NGOs, UNIDO and other international organizations partnering in the project or having relevant ongoing programs. The PAC will be chaired by the GEF Focal Point of Macedonia and it will include the Ministry of Economy, the Energy Agency and the Macedonian Bank for Development Promotion. The final composition of the PAC will be finalized during the project implementation inception phase. The PAC is envisaged to meet twice a year. Detailed terms of reference for the PAC will be prepared and agreed on during the project inception

phase. The terms of reference will be developed taking into account and in line with relevant GEF provisions, i.e. GEF/C.39/Inf. 3 of October 28, 2010.

At the beginning of the project implementation a detailed working plan for the entire duration of the project will be further developed and finalized by UNIDO and the PMU in collaboration with the MEPP, ME, EARM and other project partners. The working plan will clearly define roles and responsibilities for the execution of project activities, including monitoring and evaluation; it will set milestones for deliverables and outputs. The working plan will be used as management and monitoring tool by PMU and UNIDO and reviewed and updated as appropriate on a biannual basis. Fig.9 shows a diagram of the project implementation arrangement:

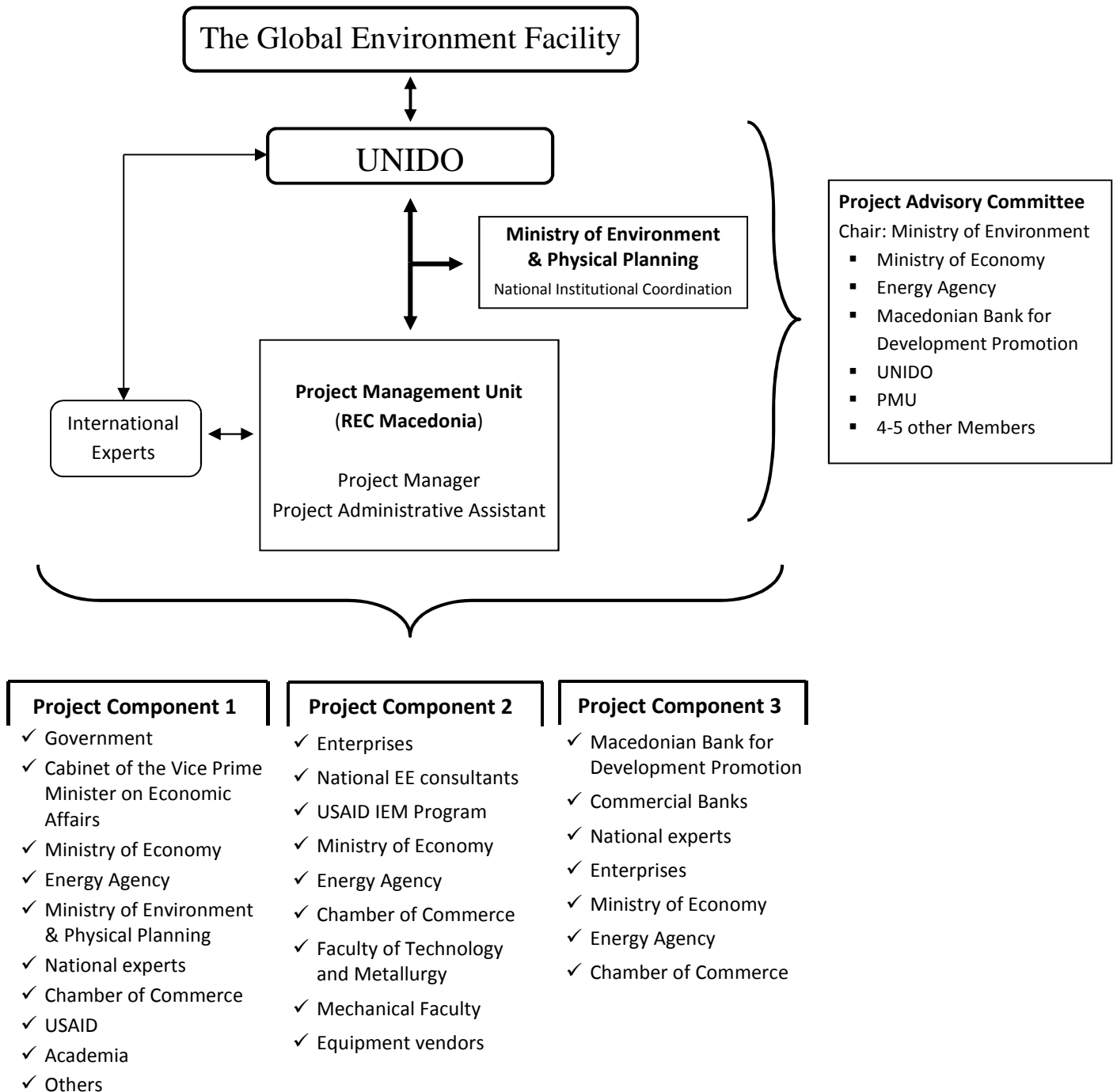


Fig. 9 Schematic of Project Implementation Structure

Table 10 – Project stakeholders and implementation engagement.

	Stakeholder	Mandate and/or function in Macedonia and for the Project
Implementing Agency	UNIDO	<p>UNIDO is the specialized agency of the United Nations that promotes inclusive and sustainable industrial development (ISID). In recent years, UNIDO has assumed an enhanced role in the global development agenda by focusing its activities on three thematic areas: poverty reduction through productive uses; trade capacity building; energy and environment. The Organization draws on four mutually reinforcing categories of services: technical cooperation, analytical and policy advisory services, standard setting and compliance, and a convening function for knowledge transfer and networking. Together with UNEP, UNIDO is co-managing and supporting the establishment and operations of the UNFCCC Climate Technology Centre and Network.</p> <p>UNIDO is the implementing agency of the present project. UNIDO will also perform limited executing functions with regard to the procurement of some international expertise inputs that national counterparts are not able and/or equipped to perform.</p>
National Executing Agencies	Ministry of Environment and Physical Planning (MEPP)	<p>The MEPP is responsible for the development and implementation of policies, legislation and regulations in the field of environment management, pollution prevention and control, climate change and physical planning. The Ministry of Environment is also responsible for ensuring that Macedonia meets the requirements and fulfils the duties set forth by different international environmental agreements that the country has subscribed, including the Kyoto Protocol. The MEPP is the National Designated Entity for the UNFCCC Climate Technology Centre and Network (CTCN).</p> <p>As chair of the Project Advisory Committee and according to Macedonian legislation the MEPP will be responsible for the overall coordination of the Government partner institutions. . It will be also leading, contributing to and overseeing the work under Outputs 1.5 and 1.6. No direct contractual arrangements are envisaged with the MEPP. International and national expertise and services will be procured by UNIDO and the REC Macedonia according to applicable UNIDO's rules and regulations.</p>

National Executing Agencies	Ministry of Economy (ME)	<p>The Department of Energy (DoE) of the ME oversees the entire energy sector, both supply and demand side, and it is in charge of all energy efficiency-related issues from a policy- and law-making perspective. The Department of Energy of the Ministry of Economy represents Macedonia within the Energy Community and it has the ultimate responsibility for Macedonia's fulfilment of the Energy Community Treaty's obligations, including the development, implementation, monitoring and reporting of the NEEAP.</p> <p>The ME-DoE will be leading the work under Output 1.1 and contribute or actively participate in all others project Component 1 outputs.</p> <p>The Department of Industry Policy (DoIP) of the ME is responsible for the development of policies, legislation and programmes aimed to support enhanced competitiveness, innovation and quality of the Macedonian industrial/manufacturing sector.</p> <p>The ME-DoIP will be leading and contribute to the work under Output 1.3 and actively participate in most of others project Component 1 outputs.</p> <p>The ME will be a member of the Project Advisory Committee. Contractual arrangements are envisaged with the ME for the establishment of the ISO 50001 certification financial incentive.</p>
	Energy Agency of the Republic of Macedonia (EARM)	<p>The EARM has the mission to support the realization of the Government energy policy through the preparation of strategies, the development and implementation of plans, regulation and programs with special emphasis on EE and RE. The EARM has been appointed as institution responsible to develop and establish the certification/licensing programme for energy auditors.</p> <p>The EARM will be leading the work under Output 1.2 and Output 1.4 and actively participate in most of others project Component 1 outputs. The EARM will be a member of the Project Advisory Committee. Contractual arrangements will be made between the project and the EARM for activities under Output 1.1, Output 1.2 and Output 1.4.</p>

National Executing Agencies	REC Macedonia	<p>The Regional Environmental Centre for Central and Eastern Europe – Country Office Macedonia (REC Macedonia) has strong expertise and knowledge of the Macedonian environmental and energy policy and legal frameworks. A well established and trusted NGO, it has long-standing track records of successful collaborations with the Ministry of Environment and other government/public institutions as well as enterprises. REC has extensive experience in developing and implementing technical assistance projects combining policy advice, stakeholder participation and capacity building.</p> <p>The REC Macedonia has led the country work for the preparation of the PIF first and of the PPG afterwards gaining unique knowledge, understanding and insight of the project and its context; it has established a collaborative and trusted working relationships with key project institutional counterparts as well as with partner enterprises.</p> <p>The REC Macedonia will host and co-fund the PMU. It will provide the legal, administrative and financial infrastructure for the procurement of the national services and expertise inputs required for many activities related to all project components. Contractual arrangements, additional to those specific for the PMU, will be made between the project and REC Macedonia also to transfer funds for procuring national services and expert inputs for project activities. The REC Macedonia will also provide in-kind contributions towards project component 2 and 3 activities.</p>
	Macedonian Bank for Development and Promotion (MBDP)	<p>The Law on the Macedonian Bank for Development and Promotion (No. 07-3635/1, 18 August 2009) established and regulates the objectives, tasks, activities, operations and organization of the MBDP.</p> <p>The primary goal of the MBDP is to support and stimulate the development of the Macedonian economy. This goal is pursued through provision of credits and other forms of support for export; support for development and growth of small- and medium-sized enterprises; provision of investment credits and insurance for export against short term commercial risk. The MBDP is a joint stock company and the Republic of Macedonia is the sole shareholder. The MBDP administers credit lines from the European Investment Bank and from the International Bank for Reconstruction and Development (IBRD) of the World Bank Group.</p> <p>The MBDP will be responsible for leading and contributing to the execution of project Component 3 activities. The MBDP will be a member of the Project Advisory Committee. Contractual arrangements will be made between the project and MBDP for the establishment of the TA Facility, the trainings and the Performance-based Financial Reward mechanism.</p>
Other Project Partners	Faculty of Mechanical Engineering	<p>The Faculty of Mechanical Engineering provides higher education and performs research activities. It cooperates with similar institutions in the region and globally and implements exchange programmes. Taught disciplines include information processes and technology, industrial design, structural design, applied thermal engineering, hydraulics, welding etc. The Faculty hosts the National Cleaner Production Centre.</p> <p>The Faculty of Mechanical Engineering will participate in and contribute to project component 2 as beneficiary as well as partner by attending and hosting some of the EnMS and ESO training events targeted to consultants and enterprises. The Faculty will make also available free-of-charge the use of various measuring equipment needed for the ESO EXPERT training and the ESO assessments.</p>

Faculty of Technology and Metallurgy	<p>The Faculty of Technology and Metallurgy provides higher education and performs research activities. It cooperates with similar institutions in the region and globally and implements exchange programmes. Taught disciplines are more industrial sector and process specific, including metallurgy, textile, metal processing, food, polymer materials, design and management of technological processes, nanotechnology etc.</p> <p>The Faculty of Technology and Metallurgy will participate in and contribute to the execution of project component 2 as beneficiary as well as partner by attending and hosting some of the EnMS and ESO training events targeted to consultants and enterprises. The Faculty will make also available free-of-charge the use of various measuring equipment beneficial for the ESO EXPERT training.</p>
TimelProekt	<p>Established in 1998, TimelProekt is a leading Macedonian private engineering company which provides consulting, design and construction services to clients in energy utilities, industry, government, financial institutions, international energy corporations and the international donor community. TimelProekt is the executing company of the USAID Industrial Energy Management project.</p> <p>The TimelProekt will be a partner in the joint-organization of awareness seminars for industry top management, EnMS training events for enterprises and consultants, training events for financing institutions, preparation and facilitation of IEE investments.</p>
Winrock International	<p>Winrock International is a non-profit organization that works with people in the United States and around the world to empower the disadvantaged, increase economic opportunity, and sustain natural resources. Winrock is the executing company of the USAID Low Emissions Development and Clean Energy Investment (LED-CEI) project.</p> <p>The UNIDO-GEF project will work and collaborate with Winrock under project component 1 and in particular within the scope of Outputs 1.1, 1.5 and 1.7.</p>
Industrial partner enterprises	<p>Partner enterprises are those that at the start of the project implementation will have made format participation and co-financing commitments to the project. As of April 2014 seven companies from different sectors have already made such commitments: 3 from iron and steel, 1 from petrochemical, 1 construction materials, 2 from food and beverages. Negotiations with three more manufacturing companies (cement, metal-working and utility services) are ongoing and commitments are expected to be secured during the project implementation inception phase.</p> <p>Partner enterprises will be beneficiaries as well as co-financiers of project activities under project component 2, providing in-kind and cash contributions towards the implementation of EnMS in line with ISO 50001 and energy system optimization assessments and projects.</p>

Additional Stakeholders	Macedonian Chamber of Commerce	<p>Founded in 2004, the Macedonian Chamber of Commerce (MCC) is an independent, nonpolitical and nonprofit organization. In the MCC are joined eight chambers: Industry Chamber, Trade Chamber, Services Chamber, Agro-business Chamber, ICT Chamber, Tourism Chamber, Accounting Chamber and the Construction Chamber. With more than 1,000 members MCC is the most representative and strong private sector association in Macedonia, advocating the interests of the Macedonian business community. The MCC carries out its functions through a network of 16 regional offices located all over the country. The MCC includes also the Macedonian Energy Association, a business association of all producers and major consumers of energy in Macedonia.</p> <p>The MCC will be a key stakeholder and prospective partner for many project activities. Collaboration with the MCC will be sought in all project components, especially within outreach, knowledge and skills development activities and promotion of the IEE investments supporting mechanisms. The MCC is envisaged to be a member of the PAC.</p>
	EE consultants and service providers	<p>Local industrial energy efficiency expertise and service offer is still limited in terms of number of service providers, technology scope, specialization and quality of services, with significant potential for market growth.</p> <p>EE consultants and service providers will be key targeted project beneficiaries and prospective partner for most capacity building and EnMS/ESO implementation activities under project component 2 and 3.</p>
	Local commercial banks	<p>The Macedonian banking sector consists of 18 commercial banks, including the MBDP. All these banks will be targeted by the project capacity building and IEE promotional activities. Banks offering or interested to offer finance for EE projects will be reached out through the MBDP and the PMU. Different approaches and communication strategy will be used for banks new to EE projects and banks with already significant portfolios of EE projects.</p>
	EE Equipment Vendors	<p>In the emerging local market of EE services there are a limited number of companies involved in the supply of energy efficient construction materials, energy efficient lighting, cooling/heating systems, heat pumps, pumps, boilers, fans, compressors, energy metering, and other pieces of equipment.</p> <p>The project will reach out to suppliers and vendors of steam systems and compressed-air systems equipment as targeted participants of 2-day User training. In collaboration with the USAID IEM project, the project will work to engage and collaborate with local suppliers of hardware and software applications energy metering, monitoring and control to promote and strengthen understanding of the EnMS/ISO 50001 and ESO approaches and applications.</p>
	Civil Society Organizations (CSO), including Women organizations	<p>There are several CSOs active in the energy efficiency field, such as MACEF, CeProSard, Mileukontakt, Front 21/42, EkoSvest and others. Their representatives will be invited to participate in the training programs of Component 2 with the objective to strengthen their capacity in EnMS and ESO and reinforce promotion between their constituencies and clients.</p> <p>The project will ensure that women and gender perspectives are integrated in project activities by regularly liaising with key relevant women associations such as the Association of women entrepreneurs (ARNA), the Union of women's organization in the Republic of Macedonia (UWORM). One women organization will be invited to be a member of the Project Advisory Committee.</p>

	USAID Macedonia and donors	The project will continue to closely collaborate with the USAID Macedonia Office and its ongoing projects (Industrial Energy Management and Clean Energy Investment). The UNIDO-GEF project will also regularly liaise with other energy donors and whenever appropriate invite representatives or beneficiaries to attend seminars and training.
	European Union Delegation to the Former Yugoslav Republic of Macedonia	<p>The EU Delegation liaise between the national authorities and EU institutions, monitoring and reporting on compliance with the political and economic criteria for membership of the EU, and alignment of legislation with EU legislation as well as capacity to implement and enforce it. The EU Delegation provides also advice on the development of TA activities to be funded by the EU. A number of energy efficiency related projects funded through the Instrument for Pre-Accession Assistance are either ongoing or in the pipeline.</p> <p>The UNIDO-GEF project will closely liaise with the EU Delegation in order to establish and ensure cooperation and synergies with EU funded ongoing and planned TA projects.</p>

B. 2. Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):

Socio economic benefits

Considering the fact that Macedonia is one of the countries in South-Eastern Europe with fewest domestic energy resources, enhancing energy efficiency and energy saving is crucial for the overall socio-economic development of the country. Energy conservation and efficiency in industry will significantly reduce the demand for electricity and fossil fuels. This will enhance the robustness of Macedonia's energy security and will increase the country's resilience against external energy supply disruptions and price fluctuations.

Deployment of energy efficiency technologies in manufacturing enterprises will increase their productivity, competitiveness and profitability, enhancing their ability to survive and grow, thus contributing to the development of national economy. Improvements in the economic performance of the manufacturing sector, in particular energy-intensive industries, and boosting of demand for and supply of industrial energy efficiency services, will lead to significant new businesses and employment opportunities.

Industrial energy efficiency is one of the most cost effective methods of reducing GHG emissions and thereby combating climate change, both for policy-makers and private sector enterprises. It is also demonstrated that non-energy side-benefits of EE in industry very often do compare, if not exceed, energy cost savings (due to reduced production downtime, reduced use of material and scrap product, improved quality, etc.). Accelerating wide adoption of selected appropriate IEE BAP/BAT will turn in additional performance improvement of and value to the Macedonia's economy.

Energy cost and other financial savings stemming from IEE are also important in terms of re-use and investment of saved resources for other purposes, including saving companies from closure. The most striking case experienced so far within the UNIDO's IEE/EnMS/ESO Global program is that of a large energy-intensive company (Iron and Steel, 580 employees) that was saved from closure thanks to the implementation of an energy management and efficiency program that produced 9 million USD savings in one year with 0 capital investments. Energy cost savings would be significant and important also for the Macedonian public and municipal bodies that will be involved in the project, such as the University of St. Cyril and Methodius (through two of its Faculties) and the Clinical Hospital of Skopje.

The implementation of EnMS and EE in manufacturing enterprises and public sector organization will have also a broader educational impact, potentially a major one, between employees of the same enterprises and public institutions

as result of their organization exemplary behaviour and the exposure to different types of awareness raising initiatives/messages; the ultimate result, experienced already elsewhere, would be that “employees would take EE home”.

As result of the implemented and catalysed EE measures the local environmental impact of energy utilization will be reduced. Less electricity and fossil fuels consumed will translate in less atmospheric emission of harmful substances such as oxides of sulfur, oxides of nitrogen and smoke. This positive impact would be particularly beneficial in Skopje, for instance, where during recent months the registered levels of airborne particulate were several times higher than the allowed threshold. The adverse effects on health such as common respiratory ailments that are associated with those emissions would be consequently decreased.

It is also expected that in a good number of cases energy management and energy efficiency will also contribute to improve the health and safety conditions of manufacturing enterprises personnel through maintenance best-practices and better control of energy systems and flows.

Consideration of gender dimensions

An analysis of the current institutional and gender equality policy set up carried out during the PPG phase (Annex I) shows that in Macedonia there is either a supportive or an enabling environment for gender equality. The argument for this statement is threefold: there is a Law that specifically promotes equal opportunities between men and women; there are Strategies that set the principle directions and objectives that the country should follow and achieve respectively in the area of non-discrimination and gender equality; and there is a National Action Plan for Gender Equality which introduces specific measures for achieving gender equality.

The analysis carried out during the project preparation on the gender sensitivity of the existing *energy efficiency policy framework*¹⁶ returned the result of gender neutral EE policy framework, meaning that neither gender specific actions are mentioned nor gender specific perspectives were taken into account when the policies and legal stipulations were formulated or their impact evaluated.

An analysis of the workforce distribution by sex in different sectors of the economy and sub-sector of industry (i.e. mining, manufacture, electricity, gas) have shown that while significant variations exist in the share of men and women between different sectors, male employees remain the majority. In the case of industry, the sector average is close to 60% male employees and 40% female employees. While this data may look satisfactory to many, looking more in details to the disaggregated data, the evidence is that women are usually employed to execute lower level jobs and the higher, better-paid and senior positions are mainly filled by men. The gender factor becomes then especially visible in the area of remuneration: in the manufacturing sector and in the energy sector the pay gap between men and women is estimated to 32% and 8% respectively.

A survey on views in the manufacturing industry about gender equality was conducted through phone interviews, targeting a small group of companies. The survey results showed that beside the formal compliance with relevant legislation, the gender dimension is not really understood or captured or levered yet in the management of industrial enterprises. An interesting result of the survey was/is the perception of the majority of respondents (mainly men for the record) that women have and show better attitude and adaptability than men towards changes and learning.

The mainstreaming of gender in the project was pursued during the design phase (i.e. PPG) through the conduction of a gender analysis and the participation in the PPG of a robust representation of women, both within the project expert team (66% of the substantive/technical experts) and on the side of the Government counterparts (about 60%). During

¹⁶ The following strategies, plans and key regulations set the Macedonian energy efficiency framework and have been reviewed: the Strategy for Improvement of Energy Efficiency in Republic of Macedonia, the first Energy Efficiency Action Plan, the Law on Energy, the Decree for indicative goals for Energy Savings, the Rulebook on Energy Performance of Buildings, the Rulebook on Energy Audits, and the Rulebook on Labelling the Energy Efficient Home Appliances.

the fully-fledged project implementation phase the integration of the gender dimension in the project activities will be ensured will be taken into due account and whenever appropriate addressed through: i) robust women representation in the Project Advisory Committee; ii) encouraging and supporting female trainees, managers and EE service providers participation; iii) involving and whenever possible collaborating with women networks and enterprises/associations' gender focal points to enhance project visibility and mainstreaming gender within project communication and other project execution activities; iv) considering gender equality and empowerment of women while development and enforcement of IEE policies and regulations and v) dissemination through the website project of related information including gender mainstreamed content where appropriate. Gender disaggregated targets have been set for project performance indicators, wherever relevant. Overall it is envisaged to achieve the target of 20% female participants in the training program. At the project implementation stage the needs of involved trainers and trainees will be assessed and wherever possible addressed: e.g. by organizing training in facilities where children can be accommodated and/or by providing babysitting services, regular breaks for nursing and others.

The project has been developed considering the *UNDO guide on gender mainstreaming in energy and climate change projects* and it is in line with the *GEF policy on gender equality and empowerment of women*. The gender analysis was conducted taking into account advice and guidance of UNIDO Gender team. Collaboration with the UNIDO Gender team will continue during the project implementation phase to ensure alignment with UNIDO and GEF policies and the best feasible integration of the gender dimension in project activities.

B. 3. Explain how cost-effectiveness is reflected in the project design:

The project focuses GEF funds on technical assistance to deliver sustained energy and CO2 savings in the most energy intensive industries of Macedonia. Sectors chosen have low energy efficiency compared to EU peers' performance and therefore significant scope for savings. Energy costs range between 20 and 40 per cent of total production costs for these sectors and therefore enterprises are very keen to co-operate with the project. The policy assistance and the train-the-trainers capacity building interventions be delivered through the project will create the conditions for sustainable impacts and progressive growth over the long term.

The technical assistance provided under Component 1 aims to elevate the profile of IEE within the ongoing EE policy and legislation development and implementation efforts by building as much as possible on existing experience, processes and programmes (i.e. financial incentives for ISO standards, certification program for Energy Auditor, other ongoing international TA projects, etc.)

Energy management systems in line with ISO 50001 and energy systems optimization (ESO) have been selected as technologies to be promoted by the project on the basis of substantial evidence that:

- i. EnMS is the best proven methodology to ensure integration of EE in daily business practices and continual improvement of energy performance;
- ii. Energy system optimization approach provides 3-5 times larger energy savings than a system component approach;
- iii. Payback periods for many ESO projects and many EnMS measures are in the range of 0 to 18 months with limited capital requirements.

EnMS and ESO are best-available techniques/technologies relevant to the entire industrial sector and largely to other economic sectors (especially EnMS that is targeted also to the commercial, public and transport sectors), therefore with a fairly large market potential even in a relatively small-economy like the Macedonian one. EnMS and ESO market development support activities to be carried out under Component 2 are bound to have a major multiplying effect over the medium- and long-term.

The technical assistance provided under Component 2 levers ongoing baseline activities such as the USAID Industrial Energy Management project and the UNIDO Low Carbon Production in the Agro-Industry project, and

strongly complement them with strong EnMS and ESO qualification programs for consultants and reinforcement of the training offers on EnMS, steam SO and compressed-air SO for enterprises.

Component 3 interventions have been designed to effectively build on the existing financing expertise, facilities and processes established by IFIs and gained by the Macedonian Bank for Development Promotion and other local commercial banks through past and ongoing experience.

Substantial efforts have been made during the PPG to strongly engage with many target beneficiaries and prospective partners through their formal commitment of significant in-kind contributions in order to concentrate as much as possible the GEF funds on the highest added-value project inputs.

Through a comprehensive set of interventions to address barriers at the policy, market and investment level, the project has been designed to achieve sustainable and long term progression of energy performance beyond the lifetime of the project, by ensuring that conducive policies and market conditions are in place to support a step change in how energy is managed within industry, and developing a ‘push-pull’ market mechanism that supports industrial energy efficiency from both market sides: with trained national EE consultants “pushing” their expertise and services into industry, and senior management/ business owners – aware of the techno-economic potential of EnMS and ESO – pulling such services into their enterprises.

The project is expected to generate cumulative Direct GHG emission savings in the range of 67,000 – 76,000 ton CO₂eq and Indirect GHG emission savings in the range of 66,000 – 72,000 ton CO₂eq. The GEF resources cost-efficiency for the Direct GHG emission savings would range from 20.9 to 18.4 USD/ton of CO₂eq; including the Indirect GHG emission savings cost-efficiency would go down to 10.4 - 9.4 USD/ton CO₂eq.

C. DESCRIBE THE BUDGETED M &E PLAN:

“According to the Monitoring and Evaluation policy of the GEF and UNIDO, follow-up studies including Country Portfolio Evaluations and Thematic Evaluations can be initiated and conducted. All project partners and contractors are obliged to (i) make available studies, reports and other documentation related to the project and (ii) facilitate interviews with staff involved in the project activities.”

Project Start

A project Inception Workshop (IW) will be held within the first two months of project start involving all relevant project stakeholders. The IW will be very important for consolidating partners’ and beneficiaries’ ownership of project activities and results; it will also allow make adjustments to the project implementation structure and the work-plan if needed. The project IW will focus on the following:

- i. Understand objectives, outputs and activities of the project: assist all partners in fully understanding and taking ownership of the project; detail the roles, support services and complementary responsibilities of local stake holders vis-à-vis the PMU.
- ii. Discuss roles, functions and responsibilities within the project’s decision making structures, including reporting and communication lines, and conflict resolution mechanisms. The terms of reference for project staff will be discussed, if needed.
- iii. Based on the project results framework, finalise the first annual work plan; review and agree on the indicators, targets and their means of verification and re-check assumptions and risks.
- iv. Provide a detailed overview of reporting, monitoring and evaluation requirements: the M&E work-plan and budget should be agreed and scheduled.
- v. Plan and schedule Project Advisory Committee (PAC). Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first PAC meeting should be held within the first twelve month following the IW.

An IW report will be prepared a key document to capture and formalise various agreements and plans decided during the meeting and it will shared with the participants. The costs for IW will be covered from the project management budget.

Key Performance Indicators (KPI)

Table 11 below shows the key performance indicators against which progress of the project will be measured during quarterly, annual, mid-term and final reviews.

Table 11 – Key Performance Indicators (KPI)

	KPI	Target at end of Project
Project Objective: 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.	Direct and indirect GHG emission reductions generated from implementation of EnMS, ESO and EE investments in industrial sector compared to baseline	<ul style="list-style-type: none"> ✓ Cumulative GHG emission reductions of at least 133,000 tonnes CO_{2eq} ✓ Involvement of at least 20% of women in the training program
Outcome 1: Enhanced promotion and support of sustainable IEE by strengthened policy and regulatory frameworks and market-based mechanisms	Status of legal requirement for large industrial and public sector energy consumers to have a certified Energy Management Practitioner.	✓ Enacted
	Status of Certification Program for Energy Management Practitioner	✓ Established
	Status of Financial incentives for ISO 50001 Certification	✓ Implemented and used by at least 5 enterprises
	Active IEE Best Practice Information and Dissemination Program	<ul style="list-style-type: none"> ✓ EnMS website section operational ✓ ESO website section operational ✓ Two 1-day workshops organized ✓ Online platforms include gender mainstreamed content where appropriate
	Status of Industrial Energy Data Management Framework	✓ Developed and formally submitted to MoEPP
	Status of Assessment of Climate Technologies potential in industry	✓ Developed, submitted to MoEPP and results reflected in CTCN NDE work
	Increased capacity of Macedonian institutions for developing, implementing and monitoring IEE and CC mitigation policies and programs	<ul style="list-style-type: none"> ✓ 25 government official trained ✓ Development of at least 2 IEE or CCM policies/regulations (considering gender equality and empowerment of women) additional to those promote and supported by the project is initiated
Outcome 2: Adoption of energy and environment management systems leading	Number of EnMS implemented Number of ESO implemented	<ul style="list-style-type: none"> ✓ 15 ✓ 10

to greater resource investments in energy efficiency measures and low carbon technologies, an increased energy productivity and competitiveness of the Macedonian industries	Number of UNIDO qualified EnMS Practitioners/ service providers Number of UNIDO qualified ESO Practitioners/service providers Number of enterprises attending at least 1 project training Investments made in EnMS, ESO and other EE measures implementation	✓ 20 (of which at least 4 women) ✓ 30 (of which at least 6 women) ✓ 50 ✓ 1 million USD
Outcome 3: Adoption of energy efficient and low carbon process / sector specific technologies	Investments mobilized	✓ 3 million USD

Annual Project Review (APR)

These key reports are prepared to monitor progress made since project start and in particular for the previous reporting period in line with GEF guidance, using required reporting templates. The APR includes, but is not limited to, reporting on the following:

- i. Progress made toward project objective and project outcomes – each with indicators, baseline data and end of project targets (cumulative)
- ii. Project outputs delivered per project outcome (annual)
- iii. Lessons learned/good practices
- iv. Expenditure reports
- v. Risk and adaptive management
- vi. Portfolio level indicators (i.e. GEF focal area tracking tools) are also used by most focal areas on an annual basis.

Mid-term of project cycle

The project will undergo an independent mid-term review at the mid-point of project implementation – after the second project year. The mid-term review will determine progress being made toward the achievement of project’s outputs and outcomes and will identify possible corrections needed. It will focus on the effectiveness, efficiency and timeliness of project implementation. It will highlight issues requiring decisions and actions and will present initial lessons learned about project design, implementation and management.

Findings of this review will be incorporated as recommendations for enhanced implementation during the final half project implementation period. The organization, terms of reference (TOR) and timing of the mid-term review will be decided after consultation between the UNIDO and parties to the project document. The TOR for this mid-term review will be prepared by the UNIDO Project Management team in consultation with the UNIDO Evaluation Group. The management response and the review will be uploaded to the UNIDO Evaluation Group website.

End of Project

An independent Final Project Evaluation will take place three months prior to the final PAC meeting and will be undertaken in accordance with UNIDO and GEF guidance. The final evaluation will focus on the delivery of the project’s results as initially planned (and as corrected after the mid-term review, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The TOR for this evaluation will be prepared by the UNIDO Project Manager based on guidance from the UNIDO evaluation group.

The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response.

During the last three months the project team will prepare the Project Terminal Report. This comprehensive report will summarise the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Learning and knowledge sharing

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

The project will identify and participate, as relevant and appropriate, in scientific, policy based and/or any other networks which may be of benefit to project implementation through lessons learned. The project will identify, analyse and share lessons learned that may be beneficial in the design and implementation of similar future projects.

Table 12 – M & E budget breakdown by activity

Type of M&E activity	Responsible Parties	Time frame	Indicative Costs (\$)		
			GEF	UNIDO	Project Partners (in-kind)
APR	PMU UNIDO PM	Annually	3,000	3,000	
Mid-term-review	PMU UNIDO PM	After the second project year	3,000	9,000	2,000
Final Project Evaluation	UNIDO PM UNIDO EVA	At the end of project implementation	16,000	16,000	7,000
Terminal Project Report	PMU UNIDO PM	1 month before end of the project	2,000	2,000	1,000
TOTAL INDICATIVE COSTS			24,000	30,000	10,000

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):
 (Please attach the [Operational Focal Point endorsement letter\(s\)](#) with this form. For SGP, use this [OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE(MM/dd/yyyy)
Daniela Rendevska	GEF Operational Focal Point Head of Unit for Bilateral and Multilateral Cooperation	Ministry of Environment and Physical Planning	September 2012

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.


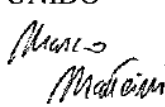
Agency Coordinator, Agency Name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
Mr. Philippe Scholtès, Managing Director, Programme Development and Technical Cooperation division (PTC) UNIDO GEF Focal Point		12/01/2014	Mr. Marco Matteini Energy and Climate Change Branch, UNIDO 	+43-1-26026-4583	m.matteini@unido.org

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ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

	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.	<ul style="list-style-type: none"> ✓ No. of enterprises with EnMS implemented ✓ 67,000 t CO₂eq - direct GHG emission savings ✓ 66,000 t CO₂eq - indirect GHG emissions savings over 10 years ✓ Involvement of at least 20% of women in all awareness event and training programs 	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ 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) 	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ Macedonian bylaws for EnMP/IEE 	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ Extent to which such Program is established (score of 0 to 4) 	<ul style="list-style-type: none"> ✓ Government ✓ Final independent evaluation 	Same as Output 1.1.
Output 1.3	Financial incentive for ISO 50001 Certification are developed and enacted	<ul style="list-style-type: none"> ✓ Extent to which the incentive is introduced (score of 0 to 4) 	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ IEE-BPID website established (score of 0 to 4) ✓ IEE-BPID workshops organized (score of 0 to 4) 	<ul style="list-style-type: none"> ✓ 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: <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> ✓ 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 	<ul style="list-style-type: none"> ✓ 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.	<ul style="list-style-type: none"> ✓ No. of enterprises implementing Energy Management Systems in line with ISO 50001 	<ul style="list-style-type: none"> ✓ 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.	<ul style="list-style-type: none"> ✓ No. of enterprises implementing low costs EnMS/ ESO/ EE projects ✓ Resources invested in EnMS/ ESO/ EE implementation ✓ 	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ No. of enterprises implementing integrated ISO 50001 and ISO 14001 and to what extent (score of 0 to 4) 	<ul style="list-style-type: none"> ✓ 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.	<ul style="list-style-type: none"> ✓ Attendance of project seminars and round tables ✓ No. of women managers attending 	<ul style="list-style-type: none"> ✓ 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.	<ul style="list-style-type: none"> ✓ No. of enterprises personnel attending EnMS or ESO 2-day trainings ✓ No. of women attending/receiving the training 	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ No. of enterprises implementing EE and low carbon BAP and BAT projects ✓ Resources invested in IEE projects implementation 	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ No. of IEE investments supported ✓ Rate of implementation of IEE investments supported 	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ No. of EE consultants attending the training 	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ No. of commercial banks attending the training ✓ No. of lending officers attending the training 	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ No. of applications received ✓ No. of rewards granted ✓ Total value of IEE investments made 	<ul style="list-style-type: none"> ✓ 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 B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

STAP COMMENTS AT PIF	
Further guidance from STAP	UNIDO Response
<p><i>1. The PIF lists the final energy consumption in different industrial sectors. The dominant sectors are iron and steel and non-metallic minerals. It is not clear which of the industries will be targeted in the proposed project. There is a need to provide a rationale for selecting industries and technologies</i></p>	<p>The project targets primarily energy intensive and large enterprises from the Iron and Steel, Petrochemical, Construction and Food, sectors. These sectors account for about 86% of total industrial energy consumption, with Iron and Steel alone accounting for 62%.</p> <p>Out of the 7 manufacturing enterprises that have so far signed co-financing commitment letters 3 are Iron & Steel making, 1 is a refinery, 1 is construction material, 2 food producers. Negotiations took place and will continue after project start to engage with the largest Macedonian cement producer.</p> <p>Selection was based on following criteria:</p> <ul style="list-style-type: none"> iv. Individual enterprise energy consumption and consequent size of potential energy savings v. Replication potential in the sector vi. Interest in EE and project activities demonstrated also through letters of co-financing commitments
<p><i>2. The PIF states best available IEE practices and technologies will be promoted. STAP recommends developing criteria for selecting the best available technologies based on their cost-effectiveness, efficiency, mitigation potential, and other related factors (project components 2 and 3)</i></p>	<p>The best available IEE practices and technologies to be promoted by the project are:</p> <ul style="list-style-type: none"> iv. Energy Management Systems (EnMS) in line with ISO 50001 v. Steam System Optimization (SSO) vi. Compressed-air System Optimization (CASO) <p>The rationale for selecting these technologies are the following:</p> <ul style="list-style-type: none"> 9. EnMS is the best proven methodology to ensure integration of EE in daily business practices and continual improvement of energy performance; 10. It is demonstrated that the energy system optimization approach provides larger energy savings than single-piece of equipment replacement approach; 11. ESO projects' requirements for capital investments are on average not too demanding (small-medium size), making them more viable for companies with financial resource or access to financing constraints; 12. Payback periods for many ESO projects and many EnMS measures are in the range of 0 to 12 months. 13. Increased ESO understanding in enterprises is very beneficial for improved operation and control of existing system; 14. All these technologies are cutting across the whole industry sector; in a small economy like Macedonia this provides larger potential market volumes and consequent returns for initial TA and private sector resources investments. 15. The selection of Steam and Compressed-air Systems is based on the significant share of energy consumption they account for in most of the industrial sub-sector, their prioritization by the Government as IEE technologies, the average age of the current stock of boilers and compressors (which seems to be higher than that of other energy auxiliary systems, i.e. pumps, fans and other motor-driven systems), the reported gap of expert/state-of-the-art services on system optimization, especially in the case of compressed-air systems
<p><i>3. The PIF lists typical components and activities, which are common for "9 out of 10" energy efficiency projects</i></p>	<p>Please see PART II: PROJECT JUSTIFICATION, sections A.4 and A. 5</p>

<p>3. <i>The PIF lists typical components and activities, which are common for "9 out of 10" energy efficiency projects submitted for GEF support. Project proponents are advised to systematically analyze specific barriers to promotion of IEE in Macedonia and provide sufficiently detailed justification for each activity in the project, addressing those nationally-specific barriers.</i></p>	<p>Please see PART II: PROJECT JUSTIFICATION, sections A.4 and A. 5</p>
<p>4. <i>In addition, the PIF states that both the supply and demand sides of energy efficiency services will be promoted. The importance and role of demand and supply side energy efficiency options need to be considered for prioritizing interventions.</i></p>	<p>The “supply and demand sides of energy efficiency services” mentioned in the PIF (and further elaborated in this Request for CEO endorsement) is referred to the local IEE market.</p> <p>The demand side (demand for industrial energy efficiency services) is represented by the manufacturing enterprises/ large energy consumers.</p> <p>The supply side (offer of industrial energy efficiency services) is represented by EE consultants, equipment vendors and other IEE service providers.</p>
<p>5. <i>Output 3.1 states three-four energy efficiency lighthouse projects will be implemented in energy intensive industrial sectors. It is necessary to identify which industrial sectors and which technologies will be implemented based on a scientific rationale. The PIF is silent on what approach will be selected for investments in IEE (component 3). STAP suggests adoption of a systems approach to improve energy efficiency for the selected industries rather than focusing on components.</i></p>	<p>Please see answers to STAP Comment 1 and 2. The project fully agrees with STAP regarding the adoption of a system approach.</p> <p>With regard to Component 3, based on further analysis and consultations carried out during the PPG, the option of EE lighthouse projects has been dropped in favour of the full use of Component 3 GEF resources for establishing mechanisms that could help in mobilizing financing for or open to IEE investments already available to the Macedonian banking sector.</p>
<p>6. <i>STAP recommends conducting a thorough cost-benefit analysis of the proposed interventions. The projects aims at market transformation however it is silent on the cost implications of proposed policies and investments. Without this information, sustainability of project activities in the long-term is questionable.</i></p>	<p>The level of resources available during the PPG and the amount of data and information currently available to the Macedonian government did not allow carrying out thorough cost-benefit analysis of specific possible and proposed interventions. However, the cost-implication aspect for possible interventions was taken into account during the project design phase, together with that of the potential benefits and the country context. The analysis was carried out on the basis of Macedonian and international expert knowledge as well as information available in the public domain.</p> <p>The project aims to accelerate growth and transformation of the local market for IEE. The intervention logic combines a strong focus on enabling the IEE market to players (on the demand and supply sides) to capture a substantial share of the existing economic potential for energy management and energy efficiency (Project Component 2 and 3), with complementary interventions at the policy and institutional level that want to raise the profile of IEE and open the way to the development, in the medium/long-term, of a robust programmatic framework for promoting and supporting EE in Macedonian industry (Project Component 1).</p>
<p>7. <i>While the PIF lists some baseline activities and legal frameworks available to support IEE, it seems that</i></p>	<p>Raising the profile of IEE at the policy and institutional level is one of the key objective of the project and the overarching goal of project Component 1.</p> <p>Please see also PART II: PROJECT JUSTIFICATION, section A. 5</p>

<p><i>the issue is not recognized explicitly in these national strategies and plans. Project proponents are advised to consider a range of recommendations at the national level to the existing laws and regulations that would elevate IEE profile among other EE measures and provide sufficient incentives for industrial enterprises to promote energy efficiency and conservation aggressively.</i></p>	
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GEF COUNCIL COMMENTS AT PIF	
Germany's comments	UNIDO Response
<p><i>Suggestions for improvements to be made during the drafting of the final project document</i></p> <ul style="list-style-type: none"> <i>• The proposed project follows a comprehensive approach without leaving out important parts. However, it remains unclear which sectors and enterprises will be selected for implementation. Likewise, it should be clarified which selection criteria will be used to identify the most relevant sectors and enterprises to achieve the project's objectives. This is especially relevant for components 2 and 3 (selection of pilot enterprises and lighthouse projects, respectively).</i> <i>• There seem to be some deeper thoughts already on the selection of enterprises and the scope of the GHG mitigation approach as the text provides detailed estimations on GHG mitigation under the heading "Global Environmental Benefits". These background calculations are not yet made transparent. Please provide more information thereon.</i> 	<p>The project targets primarily energy intensive and large enterprises from the Iron and Steel, Petrochemical, Construction and Food, sectors. These sectors account for about 86% of total industrial energy consumption, with Iron and Steel alone accounting for 62%.</p> <p>Out of the 7 manufacturing enterprises that have so far signed co-financing commitment letters 3 are Iron and Steel making, 1 is a petrochemical refinery, 1 is construction material, 2 are food producers. Negotiations took place and will continue after project start to engage with the largest Macedonian cement producer.</p> <p>Selection of enterprises to work with under Project Component 2 was based on the following criteria:</p> <ol style="list-style-type: none"> i. Large individual energy consumption and consequent significant size of potential energy savings ii. Replication potential in the sector iii. Interest in EE and project activities demonstrated also through letters of co-financing commitments <p>The PIF proposal for possible lighthouse projects under Project Component 3 has been dropped as result of further analysis and discussion with stakeholders and counterparts during the PPG (please see page 49)</p> <p>Please see the sections Global Environment Benefits on page 46 and Annex H</p>

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS¹⁷

A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

PPG Grant Approved at PIF: 50,000			
<i>Project Preparation Activities Implemented</i>	<i>GEF/LDCF/SCCF/NPIF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent To date</i>	<i>Amount Committed</i>
1. Collection of supplemental/ baseline data and analysis	7,500	13,500	0
2. Stakeholder and partners consultations	7,500	10,000	0
3. Identification and selection of partner enterprises and EE lighthouse projects	25,000	12,474	0
4. Project strategy and implementation detailing	10,000	12,500	0
Total	50,000	49,974	0

¹⁷If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/NPIF Trust Fund or to your Agency (and/or revolving fund that will be set up)

ANNEX E: PROJECT TIMETABLE

Outcome	Output	Year 1				Year 2				Year 3				Year 4	
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
1. Enhanced promotion and support of sustainable industrial energy efficiency by strengthened policy and regulatory frameworks and market-based mechanisms	1.1 Legal requirements for large industrial and public sector energy consumers to have a certified Energy Management Practitioner (EnMP) is developed and enacted														
	1.2 Certification Program for Energy Management Practitioner (EnMP) is developed and enacted														
	1.3 Financial incentive for ISO 50001 Certification are developed and enacted														
	1.4 Industrial Energy Efficiency (IEE) Best Practice Information and Dissemination (BPID) Program established and operational														
	1.5 Industrial Energy Data Management Framework developed														
	1.6 Industrial Climate Technology Needs Assessment carried out														
	1.7 Strengthened technical capacity of Macedonian institutions responsible for developing, implementing and monitoring EE and CC mitigation policies and programs and 25 public officials trained														
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	2.1 Top management of at least 50 enterprises understands the economic and environmental benefits of EE and is made aware of key relevant commercial best-available practices and technologies.														
	2.2 A group of 50 local EE and environment professionals are equipped with the technical expertise and tools required to:														
	2.3 Ten (10) enterprises from key Macedonian industrial sectors implement Energy Management Systems in line with ISO 50001.														
	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														
	2.5 Personnel of fifty (50) enterprises receive training on the implementation of EnMS and on ESO measures.														
	2.6 At least ten (10) low cost EE projects are implemented by industrial enterprises as result of their participation in the Training programs of the project.														
3. Adoption of energy efficient and low carbon process/ sector specific technologies	3.1 Technical assistance facility to support IEE investments is developed and established														
	3.2 At least 15 local EE consultants trained in IEE investments preparation														
	3.3 At least 10 bank lending officers trained in assessing IEE investments proposals														
	3.4 Performance-based financial reward mechanism for IEE investment projects established														

