UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

وزارة البيئة
جهاز شئون البيئة

gef

INDUSTRIAL ENGERY EFFICIENCY PROJECT

Integration of Energy Efficiency into Building Materials Sector Strategy

August 2017

مركز تحديث الصناعة
INDUSTRIAL MODERNISATION CENTRE

إتحاد الصناعات المصرية
FEDERATION OF EGYPTIAN INDUSTRIES

الهيئة المصرية العامة للمواصفات والجودة
Egyptian Organization for Standardization and Quality

الهيئة العامة للتنمية الصناعية
Industrial Development Authority

Executive Summary

Introduction

The Ministry of Trade and Industry has developed and launched the Ministry's strategy for 2020 in November 2016. Concurrently, an Industrial Energy Efficiency Strategy and Policy (IEESP) Report was developed by the United Nations Industrial Development Organization within the scope of the Industrial Energy Efficiency Project in Egypt (IEE Strategy), funded by the Global Environmental Facility (GEF) and implemented by UNIDO in cooperation with the Egyptian Environmental Affairs Agency (EEAA), the Ministry of Industry and Foreign Trade of Egypt (MIFT) and the Federation of Egyptian Industries (FEI). Following the formulation of the IEE policy recommendations in 2015, the Ministry of Trade and Industry requested UNIDO to provide technical inputs to integrate the IEE policy recommendations into the sectoral strategies under development under a broader stream of resource efficiency.

The objective of this report is to integrate industrial energy efficiency (IEE) policy into the sectoral policy strategies of the sector of Building Materials that the Egyptian Ministry of Trade and Industry intends to develop.

Support to National Governmental Goals and Strategies

The building material sector strategy was directly linked to the main goals of MIFT 2020 Strategy and the FEI Building Materials Chamber Vision as well as those of the MSMEs and Entrepreneurship National Strategy (2017-2022). As this energy efficiency sector strategy is part of the overall strategy of the Ministry of Industry targeting year 2020, it will work on the short term five year plan which starts with the large and medium energy intensive industries to capitalize the low hanging fruits and at the same time start with technology upgrade of some industries such as the brick industry.

Energy efficiency will contribute to the first MIFT goal which is increase in the annual industrial growth rate to 8%. It will also reduce costs and consequently increase value added of industrial products, hence contribute to Gross Domestic Product from 18% to 21% which is the second goal of MIFT. As for the goal of increasing the growth rate of exports to 10% annually, energy efficiency will enhance production, lower production cost and carbon footprint which increases competitiveness. Moreover, opening a new job market in energy management will contribute to the goal of providing 3 million decent and productive job opportunities.

Incorporation of energy efficiency within the scope of the Building materials Chamber vision, "*Embrace our mineral resources; develop our people and engage cutting edge technology to achieve global competitiveness and sustainability*", will increase competitiveness in terms of cost reduction, and compliance with emerging international standards related to carbon emissions.

Application of Egypt's IEE Strategies and Policies on Building Materials Sector

As highlighted in the IEE Strategy Report, the Egyptian industry is highly polarized in terms of size and energy-intensity. The industries were classified as large or small industries according to the number of employees as follows; "large" having more than 100 registered

employees and "small" having limited number of employees of less than 50 registered staff. As for energy intensity; energy intensive industries are the ones where energy represents a significant part of their cost structure approximately more than 10% as opposed to non-energy intensive industries were the cost of energy is minor.

The sub-sector industries are also characterized according to their ownership whether private, state owned or owned by the military and whether they target the local market or whether they export.

Cement, ceramics and glass manufacture are considered to be large, energy intensive industries as they have large number of employees and energy represents a significant part of their cost structure. They are mainly owned by the private sector and their production are either exported or consumed in the local market by governmental and private sectors. These industries have high political power, have international affiliations and have access to the latest production technologies.

Brick industries are mainly small industries, with exception of a few large ones, but energy intensive as energy represents a considerable amount of their cost. They mainly serve the local market. These industries are currently working with outdated technologies and so are operating under inefficient production conditions in terms of resources and energy consumption.

Marble and granite, tiles, pipes and ready mix concrete are small non energy intensive industries as energy is a minor contributor to their cost. Some of the pipes manufactures are large but still not energy intensive.

The UNIDO IEE Strategies and Policy Report have proposed thirteen policies that can be classified under three key strategic objectives mainly; ensuring responsive supply, drive industrial sector demand to industrial energy efficiency and enabling government institutions to plan, regulate and monitor IEE ecosystem.

Eight of the thirteen policies are a ***general set of policies*** that should be adopted first by the MIFT as they are cross cutting all sectors. These are:

- Establish system for grid-connected combined heat and power (CHP)
- Phasing out selected equipment
- Ensure Quality of Energy Management System Consulting Services through certification
- Link Qualified consulting Services to rising demand on Energy efficiency technologies
- Minimum Energy Performance Standards (MEPS)
- Create an awareness mechanism that leverages integrated information related to IEE
- Mandatory reporting for registered facilities as a condition to renew their license
- Ensure proper & effective governance mechanism of all related IEE policies and procedures

Some of these policies are have already been initiated by the Ministry of Industry either through the UNIDO IEE Project including training and certification of EE consultants and consulting firms and provision of training on some energy consuming such as motors and compressors or through the ENCPC through issuance of energy performance standards for motors. The new law of electricity will also encourage the policy on establishing a system for grid connected CHPs. These initiatives have to be more formalized in action plans along with the other above mentioned general policies. Moreover, MIFT has already established a policy unit to specifically handle industrial energy efficiency.

There are other policies that should be implemented on the ***large energy intensive industries of the building materials sector*** to achieve the Ministry's short term goals. These are:

- Include EMS in export requirements
- Include EMS as condition for state procurement
- Ensuring efficient energy performance of new facilities, operations and processes

As for the ***small energy*** and ***non-energy intensive industries*** of the ***building sector***, it is recommended to implement the following policies.

- Reach out to SMEs through intermediaries
- Capitalize on FEI fund to subsidize Industrial Energy Efficiency Projects
- Augment cooperatives fund to finance IEE projects

The brick industry in Egypt needs special attention. This sub-sector is composed mainly of small energy intensive industries that suffer from inefficient energy consumption. Support is needed at the industry level for urgent technology shift of inefficient kilns (tunnel) for silt bricks and resources planning to reduce energy consumption from source e.g. reduce production of silt bricks and increase sand bricks. Support to the brick industry can be through FEI or brick cooperatives depending on the industry's size.

Relation to MSMEs Strategy

In November 2016, MTI has launched a National Strategy to "Enhance Industrial Development and Exports" that laid the Ministry's plans for developing the industrial sector (five sectors were prioritized). Within the same document one pillar focused on developing MSMEs and linking the goals with the different prioritized sectors.

The pillars of the MSMEs Strategy were related to Policies 5, 10 and 11 of the IEE Strategy through raising the awareness of industries to the funds offered by the Central Bank of Egypt to support EE initiatives and provision of soft loans, supporting organizations that should encourage sustainable business performance and assist MSMES in being recognized for that and by providing a link in the proposed web portal to the IEE platform to offer support to industrial startups, and including in the BDS database the service providers concerned with IEE knowledge and technology transfer that are relevant to SMEs.

Relation to the MIFT Innovation Strategy

Policies 5 and 10 of the IEE Strategy were also related to the main pillars of the Industrial Innovation Strategy was developed under the leadership of MIFT.

Acknowledgement

This report is one of a series of reports focusing on strategy of integration of energy efficiency into different industrial sectors in Egypt. The reports were developed by the United Nations Industrial Development Organization within the scope of the Industrial Energy Efficiency Project in Egypt (IEE). The project is funded by the Global Environmental Facility (GEF) and implemented by UNIDO in cooperation with the Egyptian Environmental Affairs Agency (EEAA), the Ministry of Industry and Foreign Trade of Egypt (MoIFT) and the Federation of Egyptian Industries (FEI).

The report was developed under the overall responsibility and guidance of Rana Ghoneim and the coordination of Gihan Bayoumi. The Integration of Energy Efficiency into Building Materials Sector Strategy Report was authored by Environics.

A special thanks to the staff and management of the Policy Unit in Ministry of Trade and Industry Dr. Sherien El-Sabagh and her team for their valuable support. Additional thanks to The TDMEP team for their effort facilitating the report development.

Contents

List of Acronyms and Abbreviations

BDS	Business Development Services
CAPMAS	Central Agency for Public Mobilization and Statistics
CBE	Central Bank of Egypt
EE	Energy Efficiency
EEAA	Egyptian Environmental Affairs Agency
EMDS	Electrical Motor Driven Systems
EMS	Energy Management System
ENCPC	Egypt National Cleaner Production Centre
EOS	Egyptian Organization for Standardization and Quality
ERA	Electricity Regulatory Agency
EU	European Union
FEI	Federation of Egyptian Industries
GEF	Global Environmental Facility
GoE	Government of Egypt
IDA	Industrial Development Agency
IEE	Industrial Energy Efficiency
IEESP	Industrial Energy Efficiency Strategy and Policy
ITC	Industrial Training Center
MEPS	Minimum Energy Performance Standards
MoF	Ministry of Finance
MIFT	Ministry of Industry and Foreign Trade
MSMEs	Micro, Small and Medium-sized Enterprises
NQI	National Quality Institute
SMEs	Small and medium enterprises
TDMEP	Trade and Domestic Market Enhancement
UNIDO	United Nations Industrial Development Organization

1. Introduction

1.1 Background

The Ministry of Trade and Industry has developed and launched the Ministry's strategy for 2020 in November 2016. Concurrently, an Industrial Energy Efficiency Strategy and Policy (IEESP) Report was developed by the United Nations Industrial Development Organization within the scope of the Industrial Energy Efficiency Project in Egypt (IEE Strategy), funded by the Global Environmental Facility (GEF) and implemented by UNIDO in cooperation with the Egyptian Environmental Affairs Agency (EEAA), the Ministry of Industry and Foreign Trade of Egypt (MoIFT) and the Federation of Egyptian Industries (FEI).

The Ministry of Trade and Industry initiated the development of strategies for five sectors selected by the Ministry namely; Automotive, Chemical, Construction and building materials, Engineering feeding industries and Ready-made garments and textiles. The development of the sectors strategies is led by the EU programme for Trade and Domestic Market Enhancement (TDMEP) which is coordinating among various donors and stakeholders.

Following the formulation of the IEE policy recommendations in 2015, the Ministry of Trade and Industry requested UNIDO to provide technical inputs to integrate the IEE policy recommendations into the sectoral strategies under development under a broader stream of resource efficiency.

1.2 Objective of the Report

The objective of this report is to integrate industrial energy efficiency (IEE) policy into the sectoral policy strategies of the sector of Building Materials that the Egyptian Ministry of Trade and Industry intends to develop.

1.3 Methodology

The building material sector strategy relied on the approach, findings and recommendations previously developed in the IEE strategy, taking into account the constraints and opportunities based on which it has been developed. The IEE strategy was tailored to the building materials sector based on:

- Review of relevant documents
- Specifying applicability to specific sector of criteria in the IEE strategy; including dominant size of firms in the sector, energy intensity, export orientation, etc…
- Attending sector strategy meetings, and discussing relevant elements with the members of the committee.

The building material sector strategy was also directly linked to the main goals of the Ministry of Industry and Foreign Trade of Egypt (MIFT) 2020 Strategy

and the FEI Building Materials Chamber Vision as well as those of the MSMEs and Entrepreneurship National Strategy (2017-2022).

As this energy efficiency sector strategy is part of the overall strategy of the Ministry of Industry targeting year 2020, it will work on the short term five year plan.

2. Building Materials Sector Profile

The building materials sector in Egypt according to the classification of the Federation of Egyptian industries contains the following subsectors:

- Cement and related products
- Ceramic (tiles and sanitary ware)
- Bricks (cement, clay and silt)
- Marble and Granite
- Glass manufacture and glass products
- Tiles
- Pipes (clay and concrete)
- Insulation Materials

2.1 Cement

The Egyptian cement industry comprises around 25 cement plants with a total production capacity of about 68 million tons of cement per year. Ordinary Portland Cement (OPC) is the most common type of cement produced in Egypt.

With the construction boom on the rise over the years, high demand for cement that was met through new cement companies in Egypt and enhancement of existing production lines to meet the increase in local demand. However, the country has experienced a fuel crisis and the cement companies are struggling to operate at full capacity since year 2013.

Almost all cement companies are owned by the private sector with the exception of National Cement which is owned by the Government and AlArish which is owned by the Ministry of Defense.

According to the IEE Cement Benchmarking Report, the Egyptian Cement industry is considered to be one of the most energy intensive industries, with numerous employment opportunities and cash flow. Cement production goes both to the ***local market*** and for ***export***.

For the cement industry the ***main driver*** for energy consumption is the ***production process of clinker***. About 96% of the total energy consumption is used for producing clinker in the kilns. The total thermal energy consumption of the Egyptian cement sector is estimated to be 245,927,986 GJ/year. The total electrical energy consumption of the Egyptian cement sector is estimated

to be 4,950 GWh/year. Average energy costs per ton of cement ranged from 93.5 EGP/t to 167 EGP/t throughout the years 2010 - 2014.

According to the BAT Reference Document for the production of cement, lime and magnesium oxide, several factors affect the energy consumption of modern kiln systems, such as:

- raw materials properties like moisture content and burnability
- the use of fuels with different properties
- the use of a gas bypass system
- the production capacity of the kiln has an influence on the energy demand

A much smaller part of the total energy consumption is used for raw materials preparation and grinding the clinker to cement.

2.2 Ceramics

Egypt is one of the top 15 manufacturing countries in the ceramic tiles industry with a production rate of 200 million square meters in 2012, which comprised 1.8% of the total world's production by then. According to IDA, the ceramics sector in Egypt includes 37 industrial plants (IEE Benchmarking of Ceramics Sector). The sector is designed to produce about 374 thousand m^2/year of ceramic tiles (wall, floor and porcelain tiles). Most of these companies belong to the ***private sector***.

The energy consumption for ceramic tiles production is divided into thermal energy consumption, and electric energy consumption. The main drivers for thermal energy consumption are kiln firing process, drying and spray drying processes. On the other hand, the main drivers for electric energy consumption are grinding mills, pressing, in addition to drying and firing.

Energy consumption cost in the ceramic industry contributes 17% of total production cost. The electricity and NG tariffs have increased over the past years, by a number of Prime Minister Decrees.

According to IDA, the Egyptian ceramic tiles sector consumption is approximately 687 million m^3/year of natural gas and a total electrical energy consumption estimated to be 781,000 MWh/year of electricity (IEE Benchmarking of Ceramics Sector, 2014).

According to the IEE Benchmarking Report for Ceramic Industries, the best available technique for ceramic tiles attains a total specific energy consumption of 3.31 GJ/t. In order to reduce the energy consumption of the ceramic tiles industry, the general BAT that should be applied can be summarized in improving the design of kilns and dryers, recovery of excess heat from kilns especially from the cooling zone, modification of ceramic bodies, and cogeneration/combined heat and power plants.

As of 2004, the ceramic tiles and sanitary ware industry in Egypt contributed to the Egyptian macroeconomic total turnover with approximately 300 million dollars, which is almost 0.4% of the country's GDP. Also, the export turnover

was about 60 million dollars, which accounts as 20% of the total ceramic tiles and sanitary ware sector's turnover and about 0.35% of the total Egyptian exports. Moreover, around 25,000 persons were employed directly in the sector, which represented about 0.5% of the total industrial manpower in Egypt. The above-mentioned values have of course increased significantly (may be more than doubled) since the Egyptian production capacity increased from 90 million m^2 in 2004 to 220 million m^2 in 2010.

In addition, and according to a study conducted by the ceramic division in the Federation of Egyptian Industries (FEI), the Egyptian exports amounted to 391 million dollars in 2012 and 178 million dollars in 2015. This decline started to take place due to the devaluation of the Egyptian pound that led to massive increase in the production cost, which in return impacted the competitive price of Egyptian products in the region e.g. Iran, Saudi Arabia, Turkey, and UAE (IEE Benchmarking Report of the Ceramics Sector, 2016).

2.3 Bricks

Brick industry spreads over many Egyptian Governorates and hence, it depends on the use of available raw materials. There are many kinds of bricks, the most famous of which are:

- Mud brick
- Lime-sand brick
- Concrete brick (Cement brick)
- Fire brick

Clay and concrete brick manufacturing replaced the traditional red bricks since 1985 when the Government issued laws and decrees which prohibited the curettage of agricultural land for the production of bricks. The most famous type of burning kilns for clay bricks is the Hoffmann Kiln, either the open or closed type. After the law 4/1994 has been enforced, the brick industry switched from the primitive way of using the fuel in burning to a developed and controlled way in the brick curing process. The advanced burning systems, depend on several factors to adjust the air-fuel ratio. The advanced system includes injectors, to ensure the atomization of the fuel oil which helps to improve combustion (EEIF, 2000).

The open Hoffmann's kiln is built without a cover. The drying burning and cooling areas are covered with an insulated singular lay of bricks, to prevent atmospheric air from entering the kiln. The closed Hoffmann's kiln is totally covered at the top, with a fixed layer of concrete lined with fire brick for heat insulation. The closed kilns are more energy conserving than the open ones, have higher production rates and produce higher quality bricks. However, they have high investment cost and need highly skilled labor for its operation (EEIF, 2000).

2.4 Marble and Granite

Currently, Egypt has about 500 marble and granite factories and 2000 workshops. According to specialists in the industry, there are 3 types of factories: (1) factories that are just involved in cutting the blocks into plates of marble and then distributing them to workshops that handle further cutting and polishing, (2) factories that cut and polish the plates, and (3) factories that do the whole process until the final product is produced.

Shak El Thoban in Katameya has the highest concentration of marble and granite factories in Egypt reaching around 500 factories, constituting 60 % to 70 % of marble factories in the whole country.

2.5 Glass Industry

Glass industry is one of the most growing industries in Egypt. The strengths of the country in this sector are based on a number of factors, including availability and a high quality of raw material, and the strategic location of Egypt within three regional markets (Europe, Middle East and Africa) presenting a high potential for exports.

In 2005, Egypt's current production capacity of float glass is 182,500 tonnes a year, which is at least 40,000 tonnes short of domestic consumption. Egypt has weak export performance across most of flat glass products, which is partly due to the shortage of domestic production capacity in basic float glass.

In 2010, two new flat production plants were established with an approximate total annual capacity of 330,000 ton. Annual production capacity of the existing plant and the new ones amount to 500,000 ton. The annual local needs are estimated at 250,000 – 300,000 ton per year, and the balance is exported.

Energy tariffs for the glass industry follow the same tariffs as the ceramic industry, as it categorized as a moderately energy intensive industry. According to CAPMAS 2007/2008 data, energy consumption cost in the glass industry contributes to 11% of total production cost. However, this percentage has increased in energy prices for the Glass Industry (AFD, 2012).

3. Relation to Egypt's Sustainable Development Strategy 2030

According to the Sustainable Development Strategy (SDS) 2030 Vision on Energy, the Egyptian government aims at maximizing the use of domestic energy resources (traditional and renewable); and developing the capacity of its energy sector to effectively contribute to competitiveness, and to adjust effectively to domestic and international developments in the field of energy and innovation; and to be a pioneer in the field of renewable energy.

The main KPIs identified include:

- Secure energy resources
- Increase reliance on local resources
- Reduce the intensity of energy consumption
- Raise the actual economic contribution of the energy sector to national income.

In September 2014, the GoE announced the new feed in tariffs for renewable projects to encourage private developers to install 4,300 MW of renewable electricity generation capacity. In addition to the new feed in tariffs, producers will enjoy long-term leases of land charged at 2 percent of the value of energy produced, and a customs tariff of 2 percent will apply to imported equipment and materials. The government is currently developing an integrated energy strategy that includes new energy prices to reduce the energy subsidy bill. The plan also aims at developing demand-side initiatives to ease energy consumption and implement initiatives based on a phased approach. The government also took some measures to settle payments to foreign partners to encourage upstream investments and incentivize deepwater exploration. The sector strategy will also identify and implement solutions to address the various challenges related to the use of coal by heavy industries.

4. Support of Energy Efficiency to Ministry's Goals

The Ministry's Trade and Industry strategy for 2020 supports the Government's 2030 strategy and proposes a number of measures for achieving the 2020 objectives and thus 2030 goals. The vision driving the strategy is encapsulated in the following statement:

"Industrial development becomes the growth locomotive driving forward the sustainable inclusive economic growth in Egypt, responsive to domestic demand and supporting exports growth, so that Egypt becomes a vital player in the global economy, capable of coping with global fluctuations."

The main goals of the MIFT are:
1. Increase the annual industrial growth rate to 8%.
2. Increase the contribution of industrial product to Gross Domestic Product from 18% to 21%.
3. Increase the micro, small and medium enterprises sector's contribution to GDP.
4. Increase the growth rate of exports to 10% annually.
5. Provide 3 million decent and productive job opportunities.
6. Institutional development

The IEE strategy is linked to the above main goals as shown in table 1.

Table 1: Link of the IEE Strategy to MIFT 2020 Strategy

MIFT 2020 Strategy Goals	In Relation to Energy Efficiency
Increase the annual industrial	To be within energy constraints, need to

growth rate to 8%.	increase energy efficiency
Increase the contribution rate of industrial product to Gross Domestic Product from 18% to 21%.	Energy efficiency should reduce costs and consequently increase value added of industrial products (assuming fixed prices), and thus their contribution to GDP
Increase the micro, small and medium enterprises sector's contribution to GDP.	---
Increase the growth rate of exports to 10% annually.	Similar to production growth, to be within energy constraints, need to increase energy efficiency. Moreover, lower costs resulting from energy efficiency would increase competitiveness. Finally, carbon foot print is expected to become a competitive factor.
Provide 3 million decent and productive job opportunities.	Part of these jobs could be in energy management. It will represent a small amount in the range of thousands of jobs.
Institutional Development	---

5. Support of Energy Efficiency to Building Materials Chamber Vision

The Building Materials sector strategy is being developed by the EU programme for Trade and Domestic Market Enhancement (TDMEP) in consultation with a number of stakeholders including policy unit head in the Ministry of Trade and Industry, TDMEP experts and consultants, the ENCPC director, various donors who have developed thematic strategies namely GIZ, GAC/ILO, TVET/EU. The committee that was formed to develop the building material sector strategy formulated the following vision for the related FEI Chamber:

"Embrace our mineral resources; develop our people and engage cutting edge technology to achieve global competitiveness and sustainability"

Incorporation of energy efficiency will increase competitiveness in terms of cost reduction, and compliance with emerging international standards related to carbon emissions.

6. Application of Egypt's IEE Strategies and Policies on Building Materials Sector

The UNIDO IEE Strategies and Policy Report have concluded that three key strategic objectives address the three main pillars of the Industrial Energy Efficiency ecosystem, as shown in figure 1;

1. Drive industrial sector demand for Industrial Energy Efficiency
2. Ensure responsive supply:
3. Enable government institutions to plan, regulate and monitor IEE ecosystem

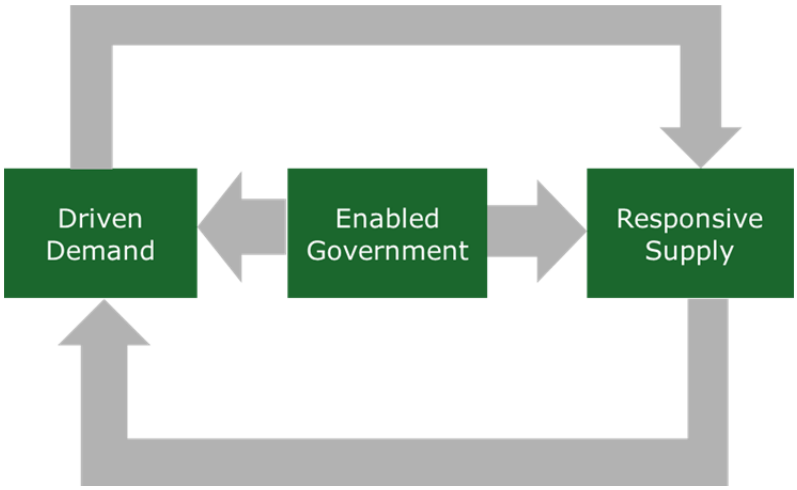

Figure 1: Main Key Strategy Objectives

Multiple approaches are needed to address the various needs of the different target groups addressed in the IEE strategy within the industrial sector depending on whether it is large or small, energy intensive or energy non-intensive.

6.1 Sector Characterization according to IEE Strategy Criteria

As highlighted in the IEE Strategy Report, the Egyptian industry is highly polarized in terms of size and energy-intensity. The industries were classified as large or small industries according to the number of employees as follows; "large" having more than 100 registered employees and "small" having limited number of employees of less than 50 registered staff. As for energy intensity; energy intensive industries are the ones where energy represents a significant part of their cost structure approximately more than 10% as opposed to non-energy intensive industries were the cost of energy is minor.

The sub-sector industries are characterized according to their ownership whether private, state owned or owned by the military and whether they target the local market or export. The main characteristic of the sub sectors is summarized in table 2 below.

Cement, ceramics and glass manufacture are considered to be large, energy intensive industries as they have large number of employees and energy represents a significant part of their cost structure. They are mainly owned by the private sector and their production are either exported or consumed in the local market by governmental and private sectors. These industries have high political power, have international affiliations and have access to the latest production technologies.

Glass products are mainly small except for a couple who manufacture crystal glass which are large industries. The industries are energy non-intensive. They are privately owned and target both the local and international market.

Brick industries are mainly small industries but energy intensive as energy represents a considerable amount of their cost. They mainly serve the local market. These industries are currently working with outdated technologies and so are operating under inefficient production conditions in terms of resources and energy consumption.

Marble and granite, tiles, pipes and ready mix concrete are small non energy intensive industries as energy is a minor contributor to their cost. Some of the pipes manufactures are large but still not energy intensive. These industries target the local market but the marble and granite also has exports.

Given the different characteristics of the industrial categories as well as their constraints, for the strategy to achieve the objectives, it will have to be sensitive to these characteristics.

Table 2: Characteristics of Building Materials Sub-sectors

Sub-Sector	Size[1]	Energy Intensity	Ownership	Export	Special Issues
Cement	Large	Energy intensive	Private ownership except National Cement which State owned and and AlArish Cement owned by the Ministry of Defense	Yes	Some have international affiliations
Ceramic (tiles and sanitary ware)	Large	Energy intensive	Private ownership	Yes	Major exporters
Bricks (cement, clay and silt)	Mostly small industries but some are large	Energy intensive	Private ownership	No	Have outdated technologies
Marble and Granite	Small industries	Energy non-intensive	Private ownership	Yes	Major exporters
Pipes (clay and concrete)	Small industries	Energy non-intensive	Private ownership	No	
Glass Sheets	Industries producing glass sheets are large	Energy intensive	Private ownership	No	
Glass Products	Mainly small but around two large factories (crystal glass production)	Energy non-intensive	Private ownership	Yes	
Tiles	Mainly small industries but some large industries	Energy non-intensive	Private ownership	No	
Ready mix concrete	Small industries	Energy non-intensive	Private ownership	No	

[1] Data on the size of the establishments in terms of number of employees was provided from the Industrial Development Agency (IDA) per subsector

Driving demand for Industrial Energy Efficiency will differ according to size. Micro-enterprises, for example, are challenging to address due to their large numbers, different affiliations, limited technical capacity, and non-bankability. Some of these facilities have outdated technologies, limited skills such as the brick industries. This implies the need for extensive support to be able to replace equipment, as well as the need for training to be able to apply IEE interventions.

For the second objective concerned with ensuring responsive supply, the services provided by the different parties will differ according to the category given their different needs and nature. For example, small and medium enterprises (SMEs) need more support in training and capacity building than larger companies who can afford to hire/ outsource experts.

Regarding the third objective which is to enable the government, the government's role will change according to the different categories. For example, there should be a consensus between the government and large industries given the political power they have arising mainly from their size and number of employees. More government support is expected to be provided to small industries to be able to optimize their energy consumption and reach their energy saving potential. In other words, while energy savings on a national level would imply government focus on energy intensive industries, the government is responsible towards helping smaller industries as well to overcome the impact of subsidy reform through energy efficiency.

In general, supply policies need to be synchronised with demand policies to ensure the success of the overall system. However, first and foremost, policy and decision-making units need to be established at the competent executive industrial entity(ies) to ensure effective governance and decision-making to all IEE policies and procedures.

Accordingly, most of the demand policies will come to effect and carry out their activities after the policy and decision-making units have been set-up and supply policies are enacted. A notable policy exception would be requiring an operative EMS from energy intensive industries with strong organisational capacity such as cement.

6.2 IEE Policies

The thirteen proposed policies categorized as driven demand, responsive supply and enable government are summarized in table 3 as follows taking into account the following common challenges:

1. Government Funding, mainly reflected in limited ability to subsidize EE investments.
2. Data Challenges including; measurement, availability, accessibility, reliability and consistency.
3. Informal Sector. This sector can hardly be targeted directly before it is formalized. Currently, the ministry of industry is considering viable

approaches to formalize these entities. When formalized, they might add to the pool of micro-enterprises which have their own challenges.

4. Micro-Enterprises are challenging to address due to their large numbers, different affiliations, limited technical capacity, and non-bankability.

Some of the policies have to be adopted first by the Ministry as they are cross cutting all sectors while other could be specifically applied to the building materials sector. Table 3 lists these policies showing which are general and which are specific to the building materials sector. Section 6.3 gives more analysis to this proposed application.

Table 3: IEE Policies

Drive industrial sector demand for Industrial Energy Efficiency	**Ensure responsive supply**	**Enable Government**
General Cross Cutting Policies		
Policy 3: Establish system for grid-connected combined heat and power (CHP) Policy 4: Phasing out selected equipment	Policy 7: Ensure Quality of Energy Management System Consulting Services through certification Policy 8: Link Qualified consulting Services to rising demand on Energy efficiency technologies Policy 9: Minimum Energy Performance Standards (MEPS) Policy 10: Create an awareness mechanism that leverages integrated information related to IEE Policy 11a:. Capitalize on FEI fund to subsidize Industrial Energy Efficiency Projects Policy 11b: Augment cooperatives fund to finance IEE projects	Policy 12: Mandatory reporting for registered facilities as a condition to renew their license Policy 13: Ensure proper & effective governance mechanism of all related IEE policies and procedures
Policies Specific to the BM Sector		
Policy 1: Include EMS in export requirements Policy 2: EMS as condition for state procurement Policy 5: Reach out to SMEs through intermediaries Policy 6: Ensuring efficient energy performance of new facilities, operations and		

processes		

Details of these policies, their proposed timeline of application or implementation as well as relevant stakeholders' roles and responsibilities are included in Appendix A; , Industrial Energy Efficiency Strategies and Policies, 2015.

6.3 General Policies to be Adopted by the Ministry

From the above thirteen policies, it is proposed that there are a ***general set of policies*** that should be adopted by the MIFT, irrespective of the specific sector, as they are effectively cross cutting all sectors.

6.3.1 General Policies Related to Driving Demand for EE

Policy 3: "Establish system for grid-connected combined heat and power (CHP)"

Description

Establishment of operational system for grid-connected combined heat and power (CHP) should be encouraged in all large energy intensive industries. The operational system should be established such that the electricity prices encourage CHP and resolve any issues that might arise with regards to grid management; metering and accounting systems, etc. are resolved before the decree is issued.

Current Efforts

According to the recent electricity law 87/2015, authorized electricity transmission and distribution companies are obliged to buy or pay the value of electricity produced from recovered energy with less than 50 MW capacity (clause 45). For capacities larger than 50 MW, electricity prices and contracts will be set on a case to case basis as electricity companies are not obliged by law to purchase electricity. Moreover, Decree no. 230/2016 issued by the Ministry of Electricity and Renewable Energy, specifies the method of calculating compensation of selling electricity to the grid based on feed-in tariffs.

Policy Owner and Stakeholders

Under this policy Egypt Electricity Regulatory Agency (ERA) will establish CHP feed-in tariff system to resolve issues that might arise with regards to grid management, metering and accounting systems, etc. prior to system initiation. It will also monitor and assess the amount of electricity supplied by CHP. An economic price and general conditions for electricity supplied from CHP will be ensured.

Phasing Policy

None, all capacities can be targeted at first with different provisions for capacities less than 50 MW and more than 50 MW.

Policy 4: "Phasing out selected equipment".

Description

Selected installed cross-cutting equipment should be replaced, over a specified number of years based on a set of criteria including nameplate performance specification, size and age such as motors and compressors.

It is proposed that Minimum Energy Performance Standards (MEPS) are the reference against which equipment replacement is obligatory, such that equipment whose efficiency is e.g. 80% that of the MEPS or less (depending on the case) will be replaced. The percentage should be set such that, when replacing the majority of equipment, an acceptable payback period (less than 5 years) is achieved. Therefore, this policy is related to Policy 9 and should be implemented concurrently.

Policy Owner and Stakeholders

As the Industrial control authority (ICA) has a history in inspection and taking legal proceedings, it will ensure targeted equipment is replaced. It will be supported by ENCPC which has adequate knowledge of the equipment on the market. It will map out cross-cutting equipment used in the different industrial sectors along with their status in order to select a set of equipment for phasing out and replacement, based on existing information.

Phasing Policy

Phasing of this policy will be done according to size (the larger first), age (the oldest first) and efficiency (the most inefficient first) simultaneously. This is to be coordinated in conjunction with policy 9 (MEPS).

6.3.2 General Policies related to Responsive Supply

Policy 7: "Ensure Quality of Energy Management System Consulting Services through certification".

Description

This policy entails the establishment of a certification mechanism for consulting firms and individuals in the field of Energy Management System that encompasses a renewal processes to the certification holders in order to ensure that they are actively operating in this field. This mechanism also allows for categorizing the consulting firms based on a point system that aids in having structured clusters of different levels of consultancies.

EMS consulting firms should be able to submit an executive summary of auditing reports to the certifying body for the number of industrial facilities served allowing for data gathering and analysis to build knowledge on sectorial trends and know how.

Current Efforts

The UNIDO IEE project in Egypt has already trained and certified a number of national consultants on EMS and ISO 50001. These consultants have already worked with energy intensive industries such as cement and ceramic industries in establishment of EMS systems and a number of them have already acquired ISO certification.

Policy Owner and Stakeholders

Certification will be the responsibility of National Quality Institute (NQI) in terms of administering the consultants, managing and renewing the certification process, managing the database of consultants, analyzing the data submitted by the consultants, continuously upgrading the certification criteria and classification of consultants based on the point system.

The IDA and FEI will support implementation of the policy, as IDA will only accept audits from certified consultants and FEI will communicate periodically to all FEI beneficiaries the latest updated consultant list and their service offering and manage the satisfaction feedback and survey and coordinate with NQI.

Phasing Policy

Phasing of the policy will start by limiting EMS consulting service providers to the certified ones while providing a grace period till the system is operational. According to policies 1 and 2, industries will acquire EMS according to the sector's energy intensity and size.

Policy 8: "Link Qualified consulting Services to rising demand on Energy efficiency technologies."

Description

The policy aims to provide the market with qualified technical consulting firms / individuals in different engineering fields (mechanical – electrical – chemical- engineering). The first stage of this policy facilitates the registration of Energy Consulting firms in the different engineering fields (technical consulting firms) through developing well designed criteria that ensures coherence and compliance. The second section of the policy is concerned with establishing an accreditation mechanism for energy consulting firms and individuals in the main engineering fields (electrical – mechanical – chemical) in order to ensure the supply of quality engineering consulting services to the industrial sector.

A renewal processes to the accreditation holders from the engineering consulting firms is also proposed including a point system in order to ensure that they are actively operating in their respective fields.

Policy Owner and Stakeholders

This policy will also be implemented by NQI which will be responsible for management of the registration and renewal processes, formulation with a steering committee the training syllabus outline in order to avail it for training centers to be delivered, managing the processes of the technical assessment with the Industrial Training Center (ITC), accrediting the technical consultants in a specific engineering field (mechanical – electrical – processes), classifying consultants based on the point system and manage the database of registered consultants and produce analysis.

The ITC will collaborate with NQI to qualify the training centers that will be eligible to deliver a specific technical training and set the consultant's examinations (assessments) and generates the results. Moreover, the Industrial Modernization Center of FEI will formulate a technical committee that will help NQI set the accreditation standards and criteria, comply with policy standards to prohibit, in due time, a consulting service to take place without being accredited and communicate periodically with all IMC and FEI beneficiaries with the latest updated consultant list and manage the satisfaction feedback and survey and coordinate with NQI.

Phasing Policy

Due to the need for a focused strategy to ensure timely and efficient implementation, this policy will be first applied to consulting firms and individuals in the field of Combined Heat and Power (CHP) and waste heat recovery followed by electric motor system and compressors as they are already addressed by ENCPC (see Policy 9 below).

Policy 9: "Minimum Energy Performance Standards (MEPS)"

Description

This policy requires Minimum Energy Performance Standards (MEPS) to be developed with a focus on equipment that comply with the following prioritization criteria:

- Have high potential energy saving
- Are used across a large number of industries
- Are imported

Current Efforts

There are currently some scattered initiatives related to this policy as the Egypt National Cleaner Production Centre (ENCPC) is working on the Industrial Electrical Motor Driven Systems (EMDS) Efficiency Programme in Egypt, funded by IFC. Moreover, the IEE project in Egypt has already delivered training in Energy Efficiency in motors and compressors.

Policy Owner and Stakeholders

However, implementation of this policy is ultimately the responsibility of the Egyptian Organization for Standardization and Quality (EOS) which is the accredited national reference and the only entity in Egypt mandated with activities regarding the specifications, quality, tests industrial calibrations in order to raise the quality of Egyptian products to make them competitive in the international and domestic markets. EOS is also concerned with consumer and environmental protection and develops standards for industrial equipment.

Other support entities to this policy include:

- ENCPC to Identify inefficient equipment by performing the necessary studies and agree on the equipment to have MEPS with EOS
- MIFT Policy Unit to set a plan for the equipment needing MEPS in coordination with Industrial Control Authority and ENCPC and coordinate between ENCPC and EOS as well as with ICA and the ministry of finance

- Ministry of Finance to develop the capacity of the customs authorities by securing training on the appropriate tools to avoid non-compliance with MEPS
- Industry and technology development sector (MoI) / FEI in identifying local manufacturers and capacity to produce EE equipment

Phasing Policy

The first phase will focus on equipment of highest energy saving potential and most cross-cutting equipment and locally manufactured equipment will be slightly delayed in order not to negatively impact their competitiveness.

Policy 10: "Create an awareness mechanism that leverages integrated information related to IEE"

Description

Establish a mechanism/platform responsible for raising awareness on the benefits of energy efficiency in Egypt, targeting both direct and indirect stakeholders. This including banks, government, industrial sector, with its various sizes and activities, and energy consulting services, in addition to all owners indicated across the other policies. Awareness is also raised on topics including IEE financing options, technologies and announcing relevant strategies and policies.

Policy Owner and Stakeholders

The owner of this policy is FEI as it is set to enhance the performance and productivity of the Sector members in addition to providing tools that facilitate the overall commercial and business effectiveness. It is also home for 16 Industrial Chambers. Accordingly, for this policy it is expected to dedicate a unit concerned with communication and awareness to be responsible for initiating the policy mechanism, including chosen platforms that this mechanism will be built upon, ensuring that a communication plan is set annually with milestones, key activities, and those responsible to carry out those tasks, ensuring participation and retrieval of all relevant information from all stakeholders and monitoring publications, round-table discussions, and inquiries and that these activities take place periodically.

The IMC supports FEI in ensuring the participation of its members and their registration on the platform and collecting and gathering feedback from its beneficiaries and reporting to FEI.

Phasing Policy

There is no phasing for this policy.

Policy 11a: "Capitalize on FEI fund to subsidize Industrial Energy Efficiency Projects"

Description

This policy aims to capitalize on the Federation of Egyptian Industries funds in order to subsidize Industrial Energy Efficiency Projects with special focus on small and medium enterprises (SMEs). In order to ensure that these funds are being put to best use, a ceiling can be set (i.e. maximum amount of money

per facility). This ceiling will be more attractive to smaller facilities (as larger ones may need larger amounts).

Policy Owner and Stakeholders
FEI would be responsible for managing the fund, defining criteria for fund disbursement, evaluating the eligibility of the different facilities, finance the projects and monitor and evaluate outcomes. The Ministry of Finance would infuse and/or direct funds to FEI.

Phasing Policy
As for implementation of this policy, the first stage will focus on- but not be exclusive to- SMEs with the highest energy intensity as they are the most sensitive to price increases. Once the policy proves its success it will be rolled out to SMEs with lower energy intensity requirements.

6.3.3 General Policies Related to Enabling Government

Policy 12: "Mandatory reporting for registered facilities as a condition to renew their license"
Description
This policy is more of a long term plan which aims at creating robust data (i.e. reliable and consistent) to enable effective decision making through mandatory reporting for registered facilities as a condition to renew their license. Data collection includes general data and information, data on industrial production, data on energy consumption.

Noting that license renewal is every 5 years, it is a requirement that yearly data must be submitted on time. As such, industrial facilities will be obliged to deliver the required data and face risks of having their license revoked if they do not deliver or deliver inaccurate data.

Policy Owner and Stakeholders
The policy will be the responsibility of the new and renewable energy unit within IDA as it is the official custodian of all energy efficiency related data. It will be responsible for identifying data to be collected, creating data template, collecting data in a timely and consistent manner, verifying accuracy of data collected, formatting and storing this data, issuing periodical reports and ensure their dissemination to all concerned entity and renewing industrial facilities' licenses when all data collection conditions have been met and coordinating with the national energy system.

Supporting entities will include IMC that will be responsible for developing communication plans and developing surveys to measure satisfaction, the Central Agency for Public Mobilization and Statistics (CAPMAS) to support the database creation and ensure that the database at IDA is compatible with that of CAPMAS, as well as the Ministry of Industry, Ministry of Electricity and Renewable Energy, Ministry of Petroleum and Mineral Resources Supreme Energy Council for identifying data required: report the information

needed in their decision making process to the IDA to integrate in the report templates and the data to be collected from the different facilities.

Phasing Policy

The first phase will focus on Building Capacity and Capable System by:

- Hiring right caliber of employees
- Provide training to bridge any existing gaps
- Build IT infrastructure
- Include Data reporting as a criteria to acquire the license

Accordingly, phasing will be based on sectors whose data is being collected through audits. In other words, given that the system will be built in the first phase, data collection should start with a small number of sectors, and then move to targeting all sectors in later phases.

Policy 13: "Ensure proper & effective governance mechanism of all related IEE policies and procedures"

Description

This policy aims to ensure proper and effective governance mechanism of all related IEE policies and procedures. It proposes identifying an Energy Efficiency Task Force within the Policy Unit of the Ministry of Industry to specifically handle industrial energy efficiency.

Policy Owner and Stakeholders

The Ministry of Industry Policy Unit will be responsible to achieve accountability and effectiveness of the industrial energy efficiency policies, the industrial energy efficiency policy unit within the Ministry of Industry will have the following roles:

1- Creating a national level industrial energy efficiency strategy and policies.
2- Ensuring effective cascading of the strategy on more operational planning levels and monitoring the implementation. This can be done through:
   a. Set the performance indicators
   b. Identify accountability
   c. Set the baseline and agree targets
3- Follow up on the strategy and policies to ensure effective planning and implementation
4- Monitor implementation (for example through random audits)

Phasing Policy

There is no phasing for this policy.

6.4 Policies Tailored to the Building Materials Sector

As this energy efficiency sector strategy is part of the overall strategy of the Ministry of Industry targeting year 2020, it will work on the short term five year plan which starts with the large and medium energy intensive industries to capitalize the low hanging fruits and at the same time start with technology upgrade of some industries such as the brick industry.

6.4.1 Policies Related to Large Energy Intensive Industries

Policy 1: "Incorporate EMS in export procedures"

Description

This policy requires sectors exporting energy intensive goods to have an operative energy management system (EMS), reported energy data and approved and implemented EE plan. As these are energy intensive, large and exporting, the sub-sectors addressed by this policy are:

- Cement industries
- Ceramics industries

Incorporating EMS for export can be carried out through the export duty such that export duties are imposed on targeted products and waived on a product if it is produced from a facility with EMS**.**

Policy Owner and Stakeholders

IDA will be responsible for implementation of this policy as it will assess the industrial facility's compliance. The following roles will be assumed by the new RE and EE unit under IDA to mobilize the different relevant units internally in IDA and coordinate with other external entities in the government and otherwise. Prior to the policy IDA will:

- Set systems for EE plans and data acquisition, consulting the relevant industries
- Set data verification, storage and analysis system

Afterwards, IDA will:

- Receive, verify and process the data
- Follow-up, assess and approve plans
- Issue EMS status certifications
- Maintain databases and feed energy data into a local database (to support decision-making) and ultimately into the national energy information system
- Issue and disseminate reports

The ENCPC will support in setting systems for EE plans and data acquisition, consulting the relevant industry. The export councils of relevant industries and FEI will negotiate the appropriate export duty for goods and the Foreign Trade Sector will draft decree on export duty. Moreover, the Energy Planning Authority will maintain national energy information database.

Phasing Policy

The first phase of implementation will start with the large, energy intensive followed by large, medium energy intensive industries. The second phase will include large, non-energy intensive followed by small, energy intensive.

Relation to other Policies

This policy is complemented by policies 7 and 8 which ensure quality consulting services for energy management system and EE technologies, respectively through certification. Policies 2 and 6 are also related to EMS implementation and they serve the same purpose. The data collected through these policies prepares for policy 12 and needs policy 13 for it to actualize.

Policy 2: "Incorporate EMS as a condition for state procurement"

Description

This policy applies to the Building Materials sector as the State is a large consumer of building materials, including:

- Cement industries
- Ceramics industries
- Glass sheets manufacturers

This policy entails incorporation of EMS as a condition for state procurement as the government has the right to stipulate certain conditions on the materials they acquire or acquired by their contractors. The conditions could include that such material are sourced from manufacturing facilities with an operative EMS system, which report energy data and implement their plans to pursue EE.

The policy proposes the imposition of these conditions in multiple ways, including adding a condition in the project's tender documents that specifies that contractors should source specific raw materials from facilities with EMS having an acceptable implementation status.

Policy Owner and Stakeholders

IDA is responsible for this policy too as it will assess the industrial facility's compliance. The following roles will be assumed by the new RE and EE unit under IDA to mobilize the different relevant units internally in IDA and coordinate with other external entities in the government and otherwise. Prior to the policy IDA will

- Set systems for EE plans and data acquisition,
- Consulting the relevant industries
- Set data verification, storage and analysis system

Afterwards, IDA will:

- Receive, verify and process the data
- Follow-up, assess and approve plans
- Issue EMS status certifications
- Maintain databases and feed energy data into a local database (to support decision-making) and ultimately into the national energy information system
- Issue and disseminate reports

Pre-policy, NQI will create an inventory of energy service providers/consultants catering for all industries and establish a system to accredit EMS consulting firms as per policy 7. On continuous basis, NQI will train relevant personnel from the industries targeted on EMS implementation. As for other support entities:

- General Authority for Government Services (GAGS) will revise the project's tender documents and ensure its integrity
- Ministry of Housing will specify suppliers with EMS in the project's tender documents

Phasing Policy

The first phase of implementation will include industries feeding into the construction industry followed by sourcing ceramics and glass from facilities with EMS. Then the second phase will include large, non-energy intensive followed by small, energy intensive.

Relation to other Policies

This policy is complemented by policies 7 and 8 which ensure quality consulting services for energy management system and EE technologies, respectively through certification. Policies 1 and 6 are also related to EMS implementation as they serve the same purpose. The data collected through this policy feeds into policy 12.

Policy 6: "Ensuring efficient energy performance of new facilities, operations and processes"

Description

Ensuring efficient energy performance of new facilities, operations and processes through limiting license provision to targeted facilities unless:

- the production technology employed is at least at par with that of the most efficient of local manufactures/technologies
- If they are committed to establish their EMS (noting that the EE plan will not include significant interventions such as equipment change for some time)

If an industry does not have a precedent locally, international best practices should be the reference as there are no local plants to compare, and compete, with. This policy is also complemented by policies 7 and 8 which ensure quality consulting services for energy management system and EE technologies, respectively through certification.

Policy Owner and Stakeholders

Implementation of the policy will be through IDA which will modify licensing criteria for new facilities to include EE assurance. Pre-policy, ENCPC will support in setting systems for EE plans and data acquisition and consulting the relevant industry.

Phasing Policy

During the first phase of implementation, new facilities to be established in all large energy intensive industries will be targeted followed by large non-energy

intensive industries. Then during the second phase small, energy intensive sectors will be targeted.

6.4.2 Policies Related to Small Energy and Non-Energy Intensive Industries

Policy 5: "Reach out to SMEs through intermediaries"

Description

Small and medium industries have certain characteristics that necessitate targeting through a tailored approach. They are distributed over various sectors, are large in number and possess limited financial, technical and organizational capacities. Given their large numbers and diversity, it is proposed that the industrial organizations are mobilized to provide tailored support to these industries.

Accordingly, this policy aims to build-up and strengthen the capacities of industrial organizations (Chamber of Building Materials and Bricks cooperatives) such that they can independently support their members on matters regarding IEE. These organizations thus become the interface through which SMEs receive assistance. The government will follow-up on the progress of these organizations and provide direct assistance to industrial organizations if requested.

Policy Owner and Stakeholders

The Agency for Development of Micro, Small and Medium projects was established by Decree 947/2017. This new entity should mobilize different capacities inside and outside the government, to support industrial organizations, offer awards for best performing enterprises create and publish guidelines and design a "model system" through which cooperatives will provide support to their members.

Support should be provided from production cooperatives and FEI to communicate needs to support their members to new entity concerned with SMEs and support their members in implementing IEE. Moreover, FEI with the Environmental Compliance Office (ECO) should extend their financial and technical services to include more facilities and sectors as per policy 11. The Ministry of Finance could establish a cooperation protocol with Cooperative Union to provide it with additional funds to finance its members on carrying out IEE based of terms and conditions. As for ENCPC it will undertake necessary audits and research to develop and update guidelines and assist in assessing award nominees. Finally IDA would receive and verify and process of the data including data from audits for financing and audits for awards) and maintain databases and feed energy data into a local database (to support decision-making) and ultimately into the national energy information system

Phasing Policy

This policy will be phased over SMEs according to their energy intensity, starting with the most energy intensive.

Relation to other Policies

Financing mechanisms is elaborated in policy 11 that capitalize on the FEI fund to subsidize IEE projects including financial schemes (soft financing) for SMEs. Policy 11b addresses increases the fund for cooperatives for IEE purposes. This policy is also complemented by policy 8 which ensures quality consulting services for EE technologies, through certification.

Policy 11b: "Augment cooperatives fund to finance IEE projects"

Description

This Policy will augment the funds available to the only cooperative union in this sector which is the Bricks Cooperative in order to finance industrial energy efficiency projects for its members. In order to increase this fund, it is proposed that the Ministry of Finance establishes a cooperation protocol with the Cooperative Union to finance its members in order for them to undertake EE projects and interventions based on certain terms and conditions. The flow of funds will only be sustained if data is provided, audits are undertaken, transparent criteria are set, relatively long payback (more than 3 years) is proven.

Policy Owner and Stakeholders

The newly established entity for Development of SMEs will be responsible for establishment of a cooperation protocol with the Cooperative Union to finance its members in order for them to undertake EE projects and interventions based on certain terms and conditions (according to policy description). The IMC and Industrial technological development sector (MoI) (including ENCPC) will undertake necessary audits to assess progress and communicate progress to IDA. As for IDA, it will receive, verify and process the data (including data from audits), communicate goals met to MoF and maintain databases and feed energy data into a local database (to support decision-making) and ultimately into the national energy information system.

The Ministry of Finance will infuse and/or direct funds to cooperatives union fund and source funds from the national budget and/or direct funds from donors and international banks.

Phasing Policy

With regards to implementation, the amount of finance to be made available to the Union will gradually increase over time in accordance to the interest expressed by the SMEs and the success of projects undertaken by them.

6.4.3 Support to the Brick Manufacturing Sub-sector

The brick industry in Egypt needs special attention. Although the policies proposed can improve the energy performance of small, energy-intensive enterprises, a limited margin for reducing specific energy consumption exists due to the technological constraints. Apart from this limited margin of energy savings, fundamental technological development is essential to achieve recognizable energy reduction.

As such an action cannot be undertaken solely through an EE policy, a comprehensive government program should be put in place to

- Develop existing range of products (e.g. sand-lime bricks versus fired bricks)
- Develop production process (e.g. tunnel furnaces versus open furnaces)

The government can also restrict technological options for new production facilities to only include efficient technologies (as per policy 6). In later stages, the government can acquire from a range of products serving the same purpose, the one with the lowest embodied energy. For instance, sand-lime bricks have an average embodied energy of 2.4 GJ/m^3 while conversely clay bricks have an embodied energy of 6.6 GJ/m^3.

7. Relation to Other Strategies

7.1 MSMEs and Entrepreneurship National Strategy

Support to the development of Micro, Small and Medium-sized Enterprises (MSMEs) and Entrepreneurship has become an over-arching priority for the Government of Egypt (GOE). In November 2016, MTI has launched a National Strategy to "Enhance Industrial Development and Exports" that laid the Ministry's plans for developing the industrial sector (five sectors were prioritized). Within the same document one pillar focused on developing MSMEs and linking the goals with the different prioritized sectors. The main policy areas of the MSMES strategy are:

1. Legal and Regulatory Environment. Objective: reducing the administrative burden and simplifying the regulatory environment for MSMEs, and Institutionalized mechanism for coordination and implementation of strategy
2. Access to finance. Objective: strengthening access to finance including financing products diversification, and innovative tools
3. Entrepreneurship Policies. Objective: Improving entrepreneurship's conducive environment and policies
4. Exports and integration into value-chains. Objective: expanding the capacity of MSMEs to integrate in local and global value chains
5. Business Development Services. Objective: Creating access to BDS
6. Cross Cutting Themes: Objective: Addressing women's entrepreneurship, environment, and technology.

The second pillar of the MSMEs Strategy related to access to finance can be directly linked to Policies 10 and 11 of the IEE Strategy by proposing raising the awareness of industries to the funds offered by the Central Bank of Egypt to support EE initiatives and provision of soft loans.

The fourth objective of the MSMEs strategy related to expanding the capacity of the MSMEs to integrate local and global value chains can be linked to Policy 5 of the IEE strategy as these support organizations should encourage

sustainable business performance and assist MSMEs in being recognized for that.

As for Policy 10 of the IEE Strategy which proposes creating an awareness mechanism that leverages integrated information related to IEE, it can be linked to objectives 3, 5 and 6 of the MSMEs strategy by providing a link in the proposed web portal to the IEE platform to offer support to industrial startups, and including in the BDS database the service providers concerned with IEE knowledge and technology transfer that are relevant to SMEs.

The IEE Strategy could be linked to the MSMEs objectives as shown in Table 4.

Table 4: Linking IEE Polices to MSME Strategy Pillars

MSME Strategy Pillars / Actions	Cross-link with IEE strategy		
	Policy 5: Strengthen industrial organizations to provide IEE support	***Policy 10 : Create an awareness mechanism that leverages integrated information related to IEE***	***Policy 11: Strengthen industrial organizations to provide IEE support***
2. Access to Finance: ***Debt Finance:*** The SME strategy states that commercial banks are reluctant to provide tailored financial services/programs for SMEs because of the high risk and costs associated with it. Thus, the Central Bank of Egypt (CBE) announced a new program to improve SMEs access to credit which aims at availing EGP 200 bn of bank credit over the next 4 years with competitive rates.		The CBE program should be made known on the IEE platforms and encourage facilities to apply for these loans to finance EE measures. The banks offering financial services to SMEs should take advantage of the awareness mechanism suggested in policy 10 to regularly promote their products and services.	A portion of CBE's EGP 200 bn should be channeled through the existing FEI fund to expand it. FEI - Environmental Compliance Office (ECO) will in turn provide its members access to soft loans.
3. Entrepreneurship Policies[2]: • Support start-ups through incubators, boot camps and business plan competitions o Information dissemination on existing service providers through web portal (This will include the activity of collecting information on existing providers, their services and procedures).		As a support to startups, information on existing service providers will be disseminated through a web portal. This web portal should have a link to the IEE platform to offer support to industrial startups.	

[2] Difference between entrepreneurship policies and MSMEs policies: entrepreneurship policy is defined as policy measures taken before and up to three years after the start of business, MSME policy concerns measures after the first three years and is defined as publicly funded measures.

MSME Strategy Pillars / Actions	**Cross-link with IEE strategy**		
	Policy 5: Strengthen industrial organizations to provide IEE support	***Policy 10 : Create an awareness mechanism that leverages integrated information related to IEE***	***Policy 11: Strengthen industrial organizations to provide IEE support***
4. Internationalization and Inter-firm Linkages: Non-exhaustive suggested actions: • Develop proactive capacity of existing MSME support organizations to assist MSMEs with export marketing opportunities, including ensuring a supply of trained private sector "brokers" to provide services to MSMEs.	These support organizations should encourage sustainable business performance and assist MSMES in being recognized for that. For example, assisting them in obtaining the required certification e.g. ISO for energy or environmental management.		
5. Business Development Services: Non-exhaustive suggested actions: • Creating Database of existing MSME Business Development Services (BDS) providers including their qualifications, areas of expertise, services provided and cost, to be shared with partners.		Include in BDS database the service providers concerned with IEE knowledge and technology transfer that are relevant to SMEs such as IMC	
6. Cross Cutting Themes: Non-exhaustive suggested actions: ***Environment (Clean Economic Growth & Climate Change):*** Facilitative access to BDS including technology transfer, especially in the new growth sectors like renewable energy, logistics and recycling		Include in BDS database the service providers concerned with IEE knowledge and technology transfer that are relevant to SMEs such as IMC	

7.2 Promotion of Small and Medium Enterprises Industrial Innovation Strategy

The Industrial Innovation Strategy was developed under the leadership of the Ministry of Trade and Industry with the objective of driving innovation in the industrial sector and competitiveness forward. This strategy takes the goals of Egypt's Sustainable Development Strategy (Egypt's Vision 2030) and MIFT's Strategy 2020 further, as well as defines 11 key measures that contribute to reach the respective Key Performance Indicators (KPIs) from MIFT´s and its affiliated institutions' side.

These measures build on the MIFT's efforts by:

- Stimulating Innovation – an innovation culture that creates more ideas and motivates more companies to consider innovation as a promising way to increase competitiveness
- Enabling innovation – provision of improved framework conditions and knowledge to support industry and academia on how to innovate and accelerate innovative ideas
- Facilitating innovation –mechanisms to support industry and academia to turn those innovative ideas into actual products, processes, services and business models
- Commercialize innovation –new products and technologies on the market. The private sector in Egypt needs better support in obtaining access to national and international clients in order to be an integral part of national and global value chains

It is proposed to link this innovation strategy to Policies 5 and 10 of the IEE policies and strategy as detailed in table 5. Moreover, some additions as linked to industrial energy efficiency in the innovation strategy are also proposed.

Table 5: Link between Innovation Strategy and IEE Policies

Elements of the innovation support chain	**Measures of the innovation support chain**	**Cross link to IEE Strategy**		**Proposed Additions to the Innovation Strategy as linked to IEE**
		Policy 5: Strengthen industrial organizations to provide IEE support	***Policy 10 : Create an awareness mechanism that leverages integrated information related to IEE***	
Stimulating Innovation	**<u>R&D</u>** A Matching Fund is a collaborative fund aiming to develop innovative and competitive Egyptian products by supporting collaborative and applied R&D projects. It aims to boost the industrial sector in Egypt by exploiting the research power in Egyptian universities and research centers, with the goal of developing innovative and competitive Egyptian products. Takes the product from the ideation stage, through the proof-of-concept and prototyping stages, until it becomes a complete product ready to be introduced to the market.			It is highly encouraged that the in-house R& D collaborate with members from academia and work towards acquiring the Matching Fund. However, it is suggested that innovation should not be restricted to products but also processes and technologies as there is plenty of room for innovation in these as well.

Elements of the innovation support chain	**Measures of the innovation support chain**	**Cross link to IEE Strategy**		**Proposed Additions to the Innovation Strategy as linked to IEE**
		Policy 5: Strengthen industrial organizations to provide IEE support	***Policy 10 : Create an awareness mechanism that leverages integrated information related to IEE***	
	<u>Awareness</u> The innovation strategy suggested Awareness for Innovation **(InnoAware)** as a measure to raise awareness about the importance of innovation for the competitiveness of the Egyptian Industry.		Extend awareness campaigns **(InnoAware)** to innovation in resource use (e.g. rationalized water and energy use, reusing waste heat/ products, integrating RE in the facility.	
	<u>Knowledge sharing</u> The innovation strategy suggested developing and maintaining an online portal **(InnoPort)** to inform different industrial stakeholders (particularly SMEs) about innovation and related topics.		The information sharing / awareness platform suggested under Policy 10 could be featured under the **InnoPort** (the central information portal owned by the MTI to increase knowledge about industrial innovation) as it would have a wider reach and more useful information to the company not just energy efficiency. The IEE platform should be accessible from the InnoPort and vice versa.	Knowledge should also be reachable for those who are not "tech-savvy" i.e. available through periodical publications in Arabic and not just the website
	<u>Awarding</u> The innovation strategy suggested the **InnoAward** which acknowledges innovative	Policy 5 includes creating awards for the best energy performance in SMEs. Innovation in improving energy performance may be promoted		The suggested InnoAward could include EE as one of the criteria upon which an award is granted

Elements of the innovation support chain	**Measures of the innovation support chain**	**Cross link to IEE Strategy**		**Proposed Additions to the Innovation Strategy as linked to IEE**
		Policy 5: Strengthen industrial organizations to provide IEE support	***Policy 10 : Create an awareness mechanism that leverages integrated information related to IEE***	
	companies and their efforts in order to create awareness for innovation and motivate companies to innovate.	and SMEs undertaking the most innovative EE interventions and achieving measurable savings should also be awarded. The award can be granted along with the suggested **InnoAward**.		
Enabling innovation	**Industry and academia** The innovation strategy promotes collaboration between industry and academia.	The collaboration between industry and academia should be reflected when forming guidelines on EE to be handed out to SMEs. Guidelines on EE handed out to SMEs should encourage critical thinking that enable innovation in energy efficiency and not only dictate specific, rigid measures to reduce consumption.		
Facilitating Innovation	**Technology and Innovation Centers (TICs)** The innovation strategy suggests under the **TICs Support Scheme** strengthening the role and capacity of Egyptian TICs as an important service provider for Egyptian companies.			The **TICs Support Scheme** will improve the ability of TICs to support enterprises in the broad field of innovation and thus can offer facilities assistance technical and otherwise along with ENCPC/IMC.

7.3 Relation to Ministry's TVET Strategy

The MIFT Vocational Education and Training Strategy specifies that the productivity and vocational training department conducts training for more than 80,000 workers in upper and middle management, supervisors and foremen in industrial facilities. Training is currently being carried out in the fields of Industrial and production engineering, management systems and economic, technical and financial affairs.

Therefore, training in EMS has to be introduced along with the other management systems. It is proposed to provide training to students who have not yet joined the workforce as well as for those who already joined the workforce and their companies. Upper and middle management should also be aware of the importance of having an EMS in place. This will be particularly beneficial for the companies that are implementing an EMS.

The productivity and vocational training department has an industrial apprenticeship system for more than 44 jobs. This system is setup by an agency specialized in setting specifications for professions, skill levels and the necessary applied technological knowledge. It is therefore advisable that applied technological knowledge includes energy efficient technologies and processes and means of rationalizing energy use in factory operations.

8. Action Plan for Building Materials Sector

8.1 Policies related to Large Energy Intensive Industries

Policy 1: Incorporate EMS in export procedures.

SECTION 1: PROGRAM DEFINITION

Program Name:	Incorporate EMS in export procedures
Program Owner:	IDA
Scope of the program:	Energy intensive, large and exporting sub-sectors namely, cement industries and ceramics industries
Rationale behind it:	Sectors exporting energy intensive products should have an operative energy management system (EMS), reported energy data and approved and implemented EE plan.
Which MTI Strategy 2020 Strategic Objectives it supports:	Energy efficiency sector strategy
Which of the ten dimensions does it support:	7. Expand R&D Budget and **Enhance Energy & Resources Efficiency**

Section 2: Program Operational Conditions

	High	Medium	Low
Priority:	√		
	Risk	Likelihood	Impact
Risks Associated	*Unfair practices* To mitigate, criteria upon which EMS certification is offered and criteria upon which EMS implementation is considered satisfactory should be clear, transparent and publicly available	Low	Low
Stakeholders / Implementation Partners:	**Policy Owner** IDA **Supporting stakeholders** ENCPC Export councils of relevant industries and FEI Foreign trade sector Energy Planning Authority **Facilitating stakeholders (not directly involved)** NQI NQI / ITC Foreign trade training center **Evaluating stakeholders** Policy Unit at MOI		

Budget:	**1,000,000 L.E.**
Donor:	
Pre-requisites	Establishment of new RE and EE unit under IDA

SECTION 3: IMPLEMENTATION TIMELINE

Start date for deploying the strategy: (In yearly quarters)	4th quarter 2017
End date: (In yearly quarters)	On going

No.	Task break down:	Duration	Owner	Precedence	Cost Items	Budget
1.1	Set templates for data and plans for BM sector	2 months	IDA/FEI		Consultant fees, in cooperation with IDA	100,000
1.2	Set mechanisms for data collection, assessment, analysis and revision.	4 months	IDA	1.1		
1.3	Set mechanisms for plan collection, assessment, analysis and follow-up.					
1.4	Personnel capacity building *	3 months	IDA	1.1, 1.2, 1.3, 1.4	Training	120,000
1.5	Acquire database software **	1 month		1.1, 1.4	Software	400,000
1.6	Set up database	2 months	IDA	1.5	Designer's fees	200,000
1.7	Prepare list of companies with operative EMS	3 months	IDA	1.6		0
1.8	Update list of companies with operative EMS	Every 6 months	IDA	1.7		0
1.9	Determine export duty as percentage of sales price (optimized for each individual energy intensive product)	3 months	MIFT/IDA/FEI/ Export council		Consultant fess	180,000
1.10	Prepare Decree imposing export duty and exemptions	1 month	MIFT	1.9		0
1.11	Issue the Decree (with adequate grace period)	1 month	MIFT	1.10		0
	Total					**1,000,000**

*Assumptions

1. RE and EE Unit is already established at IDA
2. Personnel is internally recruited from IDA information department , and RE/EE unit

***** The database software is an investment that will benefit not only the building materials sector but also all other sectors***

Milestones:	• Decree for export duty and exception percentage • Companies Database

SECTION 4: MONITORING & EVALUATION

Key Performance Indicator	Frequency of Measurement	Data Owner	Baseline	Target
Number of facilities exempted from an export duty	Annually	Foreign trade sector, General Organization for Export and Import Control (GOEIC)	N/A	% (3 years after policy is in force)
% Compliance to plans	Annually	IDA	N/A	over 90% of facilities having their actual savings 70% or more of their planned savings for a specific year (5 years after policy is in force)
% facilities submitting correct data	Annually	IDA	N/A	100% (3 years after policy is in force)

Planned Outcomes	• Sustained energy consumption reduction: Facilities will be continuously seeking the best fit reduction in energy consumption per unit product for their facilities. • Extensive information on industries: Data generated periodically from the facilities in an agreed format providing a much needed information database

Policy 2: Incorporate EMS as a condition for state procurement

SECTION 1: PROGRAM DEFINITION

Program Name:	Incorporate EMS as a condition for state procurement
Program Owner:	IDA
Scope of the program:	Building Materials sector as the State is a large consumer of building materials, including: cement industries, ceramics industries and glass sheets manufacturers
Rationale behind it:	The government has the right to stipulate certain conditions on the materials they acquire or acquired by their contractors. The conditions could include that such material are sourced from manufacturing facilities with an operative EMS system, which report energy data and implement their plans to pursue EE.
Which MTI Strategy 2020 Strategic Objectives it supports:	Energy efficiency sector strategy
Which of the ten dimensions does it support:	7. Expand R&D Budget and **Enhance Energy & Resources Efficiency**

Section 2: Program Operational Conditions

	High	Medium	Low
Priority:	√		
	Risk	Likelihood	Impact
Risks Associated	*Unfair practices* To mitigate, criteria upon which EMS certification is offered and criteria upon which EMS implementation is considered satisfactory should be clear, transparent and publicly available	Low	Low
Stakeholders / Implementation Partners:	**Policy Owner** IDA **Supporting stakeholders** National Quality Institute (NQI) Industrial training council (ITC) General Authority for Government Services (GAGS) Relevant ministries e.g. Ministry of Housing Energy Planning Authority **Facilitating stakeholders (not directly involved)** NQI ITC **Evaluating stakeholders** Policy Unit at MOI		
Budget:	**Already accounted for in Policy 1**		
Donor:			

Pre-requisites	Pre-policy, NQI will create an inventory of energy service providers/consultants catering for all industries and establish a system to accredit EMS consulting firms

SECTION 3: IMPLEMENTATION TIMELINE

Start date for deploying the strategy: (In yearly quarters)	Q4 2017
End date: (In yearly quarters)	On going

No.	Task break down:	Duration	Owner	Precedence	Cost Items	Budget
2.1	Set templates for data and plans for BM sector	Same activities as that of Policy 1	IDA/FEI		Consultant fees, in cooperation with IDA	Cost already encountered for Policy 1
2.2	Set mechanisms for data collection, assessment, analysis and revision.		IDA	2.1		
2.3	Set mechanisms for plan collection, assessment, analysis and follow-up.					
2.4	Personnel capacity building*		IDA	2.1, 2.2, 2.3, 2.4	Training	
2.5	Acquire database software			2.1, 2.4	Software	
2.6	Set up database		IDA	2.5	Designer's fees	
2.7	Prepare list of companies with operative EMS	3 months	IDA	2.6		
2.8	Update list of companies with operative EMS	Every 6 months	IDA	2.7		
2.9	Prepare Circular imposing state consumers to employ only companies with operative EMS and EE action plan	1 month	GAGS	2.7, 2.8		
2.10	Issue the Circular (with adequate grace period)	1 month	GAGS	2.9		

*Assumptions

1. RE and EE Unit is already established at IDA
2. Personnel is internally recruited from IDA information department , and RE/EE unit

Milestones:	• Circular imposing state consumers to employ companies with EMS • Database of companies with EMS

SECTION 4: MONITORING & EVALUATION

Key Performance Indicator	Frequency of Measurement	Data Owner	Baseline	Target
Number of bidders for tenders	Annually	Government entity issuing the tender	N/A	Annual increase
% Compliance to plans	Annually	IDA	N/A	over 90% of facilities having their actual savings 70% or more of their planned savings for a specific year (5 years after policy is in force)
% facilities submitting correct data	Annually	IDA	N/A	100% (3 years after policy is in force)

Planned Outcomes	• Sustained energy consumption reduction: Facilities will be continuously seeking the best fit reduction in energy consumption per unit product for their facilities. • Extensive information on industries: Data generated periodically from the facilities in an agreed format providing a much needed information database

Policy 6: Ensuring efficient energy performance of new facilities, operations and processes

SECTION 1: PROGRAM DEFINITION

Program Name:	Ensuring efficient energy performance of new facilities, operations and processes
Program Owner:	IDA
Scope of the program:	Large energy intensive industries
Rationale behind it:	Ensuring efficient energy performance of new facilities, operations and processes through limiting license provision to targeted facilities unless: • the production technology employed is at least at par with that of the most efficient of local manufactures/technologies • If they are committed to establish their EMS (noting that the EE plan will not include significant interventions such as equipment change for some time)
Which MTI Strategy 2020 Strategic Objectives it supports:	Energy efficiency sector strategy
Which of the ten dimensions does it support:	7. Expand R&D Budget and **Enhance Energy & Resources Efficiency**

Section 2: Program Operational Conditions

	High	Medium	Low
Priority:		√	
	Risk	Likelihood	Impact
Risks Associated	When comparing technologies of new facilities with existing ones it has to be ensured that the facilities are similar in terms of production processes. If not, then the new facility should be compared to international best practice.	Low	Low
Stakeholders / Implementation Partners:	**Policy Owner** IDA **Supporting stakeholders** ENCPC Energy Planning Authority **Facilitating stakeholders (not directly involved)** NQI ITC **Evaluating stakeholders** Policy Unit at MOI		
Budget:	**25,000**		

Donor:	UNIDO
Pre-requisites	Pre-policy, ENCPC will support in setting systems for EE plans and data acquisition and consulting the relevant industry.

SECTION 3: IMPLEMENTATION TIMELINE

Start date for deploying the strategy: (In yearly quarters)	Q1 2018
End date: (In yearly quarters)	On going

No.	Task break down:	Duration	Owner	Precedence	Cost Items	Budget
6.1	Research local market*	3 month	IDA			
6.2	Update EIA Guidelines with requirement of EMS for new large energy intensive industries	1 month	EEAA		Consultant's fees	25,000
6.3	Update database with new companies**	Continuous	IDA			
	Total					25,000

* UNIDO IEE Benchmarking studies provides adequate base for a number of subsectors (cement, ceramics)

** Assuming database is already established for policies 1 and 2

Milestones:	• Efficient energy performance of new facilities

SECTION 4: MONITORING & EVALUATION

Key Performance Indicator	Frequency of Measurement	Data Owner	Baseline	Target
Facilities rejected a license due to failure to abide by EE requirements	Annually	IDA	N/A	0%
% facilities submitting correct data	Annually	IDA	N/A	100% (3 years after policy is in force)

Planned Outcomes	• Sector upgrade: Introduction of EE technologies to the market, improving the sector's energy performance • Raising awareness: Signaling to the other market players that the best technologies are available and operative locally. This can be supported by case studies.

8.2 Policies Related to Small Energy and Non-Energy Intensive Industries

Policy 5: Reach out to SMEs through intermediaries

SECTION 1: PROGRAM DEFINITION

Program Name:	Reach out to SMEs through intermediaries
Program Owner:	The Agency for Development of Micro, Small and Medium projects
Scope of the program:	Small and Medium industries such as bricks
Rationale behind it:	Industrial SMEs are distributed over various sectors, are large in number and possess limited financial, technical and organizational capacities. Given these constraints this policy aims to build-up and strengthen the capacities of industrial organizations (Chamber of Building Materials and Bricks cooperatives) such that they can independently support their members on matters regarding IEE.
Which MTI Strategy 2020 Strategic Objectives it supports:	Energy efficiency sector strategy / MSMEs Strategy
Which of the ten dimensions does it support:	7. Expand R&D Budget and **Enhance Energy & Resources Efficiency**

Section 2: Program Operational Conditions

	High	Medium	Low
Priority:		√	
	Risk	Likelihood	Impact
Risks Associated	There are expected to be plenty of issues on the agenda of the Agency and energy efficiency might not be a priority. Energy efficiency should be considered under resource efficiency and waste minimization which are pressing issues to improve productivity.	Moderate	Moderate
Stakeholders / Implementation Partners:	**Policy Owner** The Agency for Development of Micro, Small and Medium projects **Supporting stakeholders** Production cooperatives and Federation of Egyptian Industries (FEI) Ministry of finance Industrial technological development sector (MoI) (including ENCPC) IDA **Facilitating stakeholders (not directly involved)** Production cooperatives and Federation of Egyptian Industries (FEI)		

	Evaluating stakeholders The Agency for Development of Micro, Small and Medium projects Production cooperatives and Federation of Egyptian Industries (FEI)
Budget:	**1,280,000 L.E.**
Donor:	
Pre-requisites	Establishment of Agency for Development of Micro, Small and Medium projects (already established)

SECTION 3: IMPLEMENTATION TIMELINE

Start date for deploying the strategy: (In yearly quarters)	Q4 2018
End date: (In yearly quarters)	On going

No.	Task break down:	Duration	Owner	Precedence	Cost Items	Budget
5.1	Develop data templates	2 months	IDA/MSMEs		Consultant's fees	200,000
5.2	Set mechanisms for data collection, assessment, analysis and revision.	4 months	IDA/MSMEs			
5.3	Conduct audits to develop guidelines	6 months	MSMEs/IMC	5.1, 5.2		
5.4	Develop guidelines	3 months	MSMEs/IMC	5.3		
5.5	Personnel capacity building *	3 months	MSMEs	5.4	Training	120,000
5.6	Acquire database software	1 month	IDA		Software	Cost already accounted for in Policy 1
5.8	Set up database	2 months	IDA		Designer's fees	
5.9	Develop award programs	6 months	MSMEs		Consultant's fees	100,000
5.10	Engage financiers	6 months	MSMEs/ Ministry of Finance			
5.11	Grant awards	Annually	MSMEs	5.9 & 5.10		1,000,000
5.12	Publicize initiatives for first two years (based on submission of awards)	2 years	MSMEs	5.11	Consultant's fees	60,000
	Total					**1,280,000**

* Assumption: Agency has already recruited staff from MIC or Social Fund

Milestones:	• Working system

SECTION 4: MONITORING & EVALUATION

Key Performance Indicator	Frequency of Measurement	Data Owner	Baseline	Target
Guidelines issued relative to the targeted sectors	3 years	Agency	N/A	100% of industrial sectors (3 years)

Number of award applicants	Annually	Agency	N/A	More than 20% increase
Number of facilities requesting finance	Annually	Production cooperatives and FEI	N/A	100% annual increase (for the first 5 years)

Planned Outcomes	• Awareness: Heightened awareness regarding potential for EE with SMEs • Improved conditions: Alleviating burdens on SMEs due to energy price hikes • Capacity building: Strengthening the role of industrial associations • Better insight on SMEs: By obtaining energy data regarding SMEs industries from awards, audits and finance projects. • Institutional strengthening: Stronger reliance on, and affiliation to, industrial organizations

Policy 11b: Augment cooperatives fund to finance IEE projects

SECTION 1: PROGRAM DEFINITION

Program Name:	Augment cooperatives fund to finance IEE projects
Program Owner:	The Agency for Development of Micro, Small and Medium projects
Scope of the program:	Cooperative Unions
Rationale behind it:	This Policy will augment the funds available to the only cooperative union in this sector which is the Bricks Cooperative Union in order to finance industrial energy efficiency projects for its members. In order to increase this fund, it is proposed that the Ministry of Finance establishes a cooperation protocol with the Cooperative Union to finance its members in order for them to undertake EE projects and interventions based on certain terms and conditions
Which MTI Strategy 2020 Strategic Objectives it supports:	Energy efficiency sector strategy / MSMEs Strategy
Which of the ten dimensions does it support:	7. Expand R&D Budget and **Enhance Energy & Resources Efficiency**

Section 2: Program Operational Conditions

	High	Medium	Low
Priority:		√	
	Risk	Likelihood	Impact
Risks Associated	The fund may be used to finance projects other than energy efficiency projects or remain under-utilized. Thus, apart from	Likely	Medium

	specifying the amount of finance to be made available to the Union, the protocol states that the amount will gradually increase over time in accordance with the interest expressed by the SMEs and the success of projects undertaken by them. A strong monitoring and evaluation process must be put in place to guarantee that funds are managed in a transparent manner		
Stakeholders / Implementation Partners:	**Policy Owner** The Agency for Development of Micro, Small and Medium projects **Supporting stakeholders** Ministry of Finance IMC and Industrial technological development sector (MoI) (including ENCPC) IDA **Facilitating stakeholders (not directly involved)** NQI /ENCPC **Evaluating stakeholders** Energy Planning Authority Industrial Development Authority The Agency for Development of Micro, Small and Medium projects Production cooperatives		
Budget:	**10,250,000 L.E.**		
Donor:			
Pre-requisites	7. Expand R&D Budget and Enhance Energy & Resources Efficiency		

SECTION 3: IMPLEMENTATION TIMELINE

Start date for deploying the strategy: (In yearly quarters)	Q2 2018
End date: (In yearly quarters)	Q2 2010

No.	Task break down:	Duration	Owner	Precedence	Cost Items	Budget
11b.1	Assess initial financial needs**	3 months	MSMEs	5.3	Consultant's fees	50,000
11b.2	Establish the protocol's terms and conditions	3 months	MSMEs/ MIFT		Consultant's fees	50,000
11b.3	Set up the mechanism for evaluating and selecting from applicants	3 months	MSMEs		Consultant's fees	50,000

11b.4	Establish a monitoring and evaluation system	3 months	MSMEs		Consultant's fees	100,000
11b.5	Establish cooperation protocol	1 month	MSMEs/MIFT/Coop			
11b.6	Transfer initial fund of finance	2 years	MSMEs/MIFT	11b.5		10,000,000
11b.7	Manage fund disbursement	continuous	Coop Union	11b.1 - 11b.5		
11b.8	Monitoring & Evaluation	continous	MSMEs	11b.7		
	Total					10,250,000

Milestones:	• Working system for funding MSMEs

SECTION 4: MONITORING & EVALUATION

Key Performance Indicator	Frequency of Measurement	Data Owner	Baseline	Target
Increase in disbursed funds	Measured every quarter to track growth in reach	Ministry of finance	N/A	N/A
Increase in loan applications	Measured every quarter to track growth in reach	Ministry of finance	N/A	N/A
% Energy saved due to implementing IEE projects from Cooperatives Union	Every 6 months	Cooperatives Union	N/A	N/A

Planned Outcomes	• Increased reach to SMEs: This policy enables cooperatives to provide a channel for the finance associated with energy efficiency projects to deserving small enterprises that otherwise would not be able to afford the investment nor would be successful at applying for grants to finance it. Some small enterprises do not deal with banks, limiting their financing options. • Overcome the challenge with non-bankable facilities: This policy establishes a framework for financing outside the traditional banking infrastructure. To this end it is able to reach and provide support to the non-bankable segment of SMEs and facilities that face challenges and obstacles in their access to finance. • Improved conditions: Alleviating burdens on SMEs due to energy price hikes • Institutional strengthening: Stronger reliance on, and affiliation to, industrial organizations • Better knowledge on small industries: Micro-data of the different small industries will be acquired

Support to the Brick Manufacturing Sub-sector

SECTION 1: PROGRAM DEFINITION

Program Name:	Support to the Brick Manufacturing Sub-sector
Program Owner:	MSMEs
Scope of the program:	Brick Manufacturing Sub-sector
Rationale behind it:	The brick industry in Egypt needs special attention. Although the policies proposed can improve the energy performance of small, energy-intensive enterprises, a limited margin for reducing specific energy consumption exists due to the technological constraints. Apart from this limited margin of energy savings, fundamental technological development is essential to achieve recognizable energy reduction. Such an action cannot be undertaken solely through an EE policy, a comprehensive government program should be put in place to • Develop existing range of products (e.g. sand-lime bricks versus fired bricks) • Develop production process (e.g. tunnel furnaces versus open furnaces)
Which MTI Strategy 2020 Strategic Objectives it supports:	Energy efficiency sector strategy / MSMEs Strategy
Which of the ten dimensions does it support:	7. Expand R&D Budget and **Enhance Energy & Resources Efficiency**

Section 2: Program Operational Conditions

	High	Medium	Low
Priority:		√	
	Risk	Likelihood	Impact
Risks Associated	Technological shifts are always resisted by the incumbent industries. Accordingly, these should be considered as long term undertakings requiring political skills as much as technical and economic knowledge. The initiation of this technological shift is to come from outside the current industries providing adequate pressure to follow it.	High	Medium
Stakeholders / Implementation Partners:	FEI/ Bricks Cooperative/ Agency for MSMEs		
Budget:	**250,000 L.E.**		

Donor:	UNIDO
Pre-requisites	

SECTION 3: IMPLEMENTATION TIMELINE

Start date for deploying the strategy: (In yearly quarters)	Q2 2018
End date: (In yearly quarters)	Q2 2020

No.	Task break down:	Duration	Owner	Precedence	Cost Items	Budget
B1	Plan for shifting to more energy efficient products (sand-lime bricks versus fired bricks)	6 months	IDA/MSMEs		Consultant fees	250,000
B2	Plan for use of efficient processes (for fired bricks)					
B3	Mobilize investors especially in areas remote from current brick producers	6 months	IDA/ Min of Investment	B1, B2		0
B4	Implement investments	2 years	IDA/MSMEs	B3		0
B5	Prepare and issue Decree restricting new production facilities to efficient technologies.	1 month		B4		0
B6	Publicize achievements	3 months	IDA/MSMEs	B4		0
	Total					250,000

Milestones:	• Plans published • Investments implemented

SECTION 4: MONITORING & EVALUATION

Key Performance Indicator	Frequency of Measurement	Data Owner	Baseline	Target
Percentage of brick production Shifted to energy efficient	Annually	MIFT	NA*	100%
Percentage of brick factories still	Annually	MIFT	NA*	0%

inefficient				
Number of demands for support from existing brick kilns				

*will be investigated through B1 and B2

Planned Outcomes (mostly post 2020)	• The government is in a position to acquire from a range of products serving the same purpose, the one with the lowest embodied energy. Similar to policy 2 • Current brick plants requesting support to join technological shifts

References

AFD, Program to Stimulate Energy Efficiency in Energy Intensive Industries in Egypt, 2012

Egypt Environmental Initiative Fund (EEIF), Operational manual For Clay Brick Manufacture in Egypt, 2000.

Egyptian-German Promotion of Small and Medium Enterprises/GIZ, Industrial Innovation Strategy, 2016

Government of Egypt, Sustainable Development Strategy Egypt Vision 2030.

Ministry of Trade and Industry, MSMEs and Entrepreneurship National Strategy (2017-2022): Capturing Opportunities of Economic Transformation, Draft 1: December 2016.

UNIDO/EEAA/GEF, Industrial Energy Efficiency in Egypt, Benchmarking Report for the Cement Sector, 2014

UNIDO/EEAA/GEF, Industrial Energy Efficiency in Egypt, Benchmarking Report for the Ceramic Sector, 2016

UNIDO/EEAA/GEF, Industrial Energy Efficiency in Egypt, Industrial Energy Efficiency Strategies and Policies, 2015

Appendix A:

Industrial Energy Efficiency Strategies and Policies