



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



SSTIC Impact Stories

Egyptian Programme for Promoting Industrial Motor Efficiency

SUMMARY

The energy efficiency programme in Egypt is a South-South Triangular and Industrial Cooperation initiative implemented by the United Nations Industrial Development Organization in collaboration with the Global Environment Facility and the Ministry of Industry, Egyptian National Cleaner Production Center (ENCPC) and the Federation of Egyptian Industries (FEI).

The program aims to improve the efficiency of Electric Motor Driven Systems (EMDS) and accelerate the market penetration of energy-efficient motors in the industrial sector through a range of measures including policy, financing, awareness raising and technical assistance. The project addresses motor system improvements and replacements in industries across Egypt.

The cost-effective motor system optimization measures and the replacement of inefficient motors are expected to result in a 40% reduction in energy use. The participating industries in the project are identified following selection criteria, which will include, among other things, environmental and social safeguard aspects.



EMDS Training for Egyptian consultants and industrial representatives in 2021

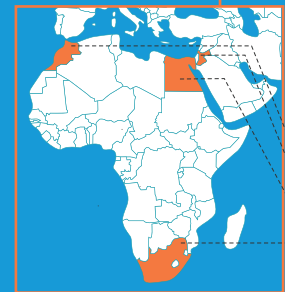
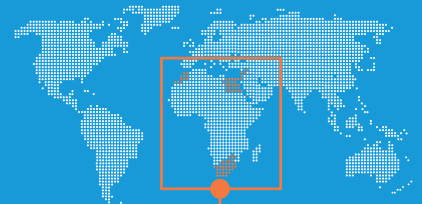
WORKING TOWARDS THE SDGs



SOUTH SOUTH COUNTRIES:

Egypt, Morocco, South Africa, Palestine

IDENTIFIED COUNTRIES:



Morocco
Palestine
Egypt
South Africa



SOUTH SOUTH PARTNERS:

- United Nations Industrial Development Organization (UNIDO)
- Egyptian Ministry of Industry
- Egyptian National Cleaner Production Center (ENCPC)
- Federation of Egyptian Industries (FEI)

DONOR

- Global Environmental Facility (GEF)

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CAPACITY BUILDING INITIATIVES

- 1 The UNIDO Egyptian Programme for Promoting Industrial Motor Efficiency highlights innovation, technology and knowledge transfer and the consolidation of a chain of south-south training partnership among southern countries on good industrial practices related to Energy Efficiency. South African experts previously trained by UNIDO on energy efficiency disseminated energy efficiency knowledge techniques to Egyptian trainees on subjects such as motor systems (MSO), compressed air systems optimization (CASO), and pump systems optimization (PSO).



Albert Williams, UNIDO South African expert delivering a training on Compressed Air Systems in Egypt in 2022

- 2 The Egyptian Programme for Promoting Industrial Motor Efficiency emphasized the combination of practical experience and theoretical knowledge in engineering. Through group work, industrial visits, and knowledge sharing, trainees were equipped with the skills to promote Energy Efficiency practices in Egypt and provide support to other countries like Morocco and Palestine.

"In 2016, UNIDO launched an industrial motor efficiency program in Egypt. I've since been certified in MSO, CASO, and M&V, with training from South African experts. In 2019, UNIDO assigned me to deliver a similar program in Morocco. The South African experts' practical knowledge from similar developing countries was particularly valuable, confirming the viability of the management and technical guidelines for our context."

*–Samir KHAFAGUI, Trainer,
Egyptian Programme for Promoting Industrial Motor Efficiency*

- 3 In Morocco, in 2019, Egyptian trainers who were previously trainees delivered a programme aiming at certifying energy management implementation experts under the UNIDO project of "Sustainable Energy for All", a Global Industrial Energy Efficiency Accelerator (IEEA) project.

- 6 The journey of the Egyptian Programme for Promoting Industrial Motor Efficiency in promoting industrial energy efficiency over the last decade was disseminated in a training organized by the International Energy Agency in March 2024 for African countries. This was considered a good exchange between Egypt and African countries.



WHAT IS SSTIC?

South-South and Triangular Industrial Cooperation (SSTIC)

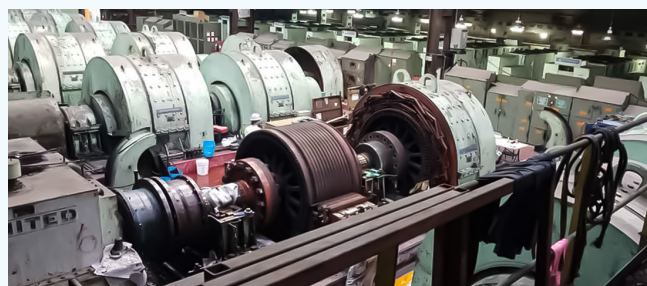
Is a process whereby two or more developing countries pursue their individual and/or shared national capacity development objectives through exchanges of knowledge, skills, resources and technical know-how, and through regional and interregional collective actions. UNIDO's SSTIC services are following the guiding principles for South-South cooperation set out in the Buenos Aires outcome document:

- 1 respect for national sovereignty
- 2 mutual benefit
- 3 national ownership and independence
- 4 equality
- 5 non-conditionality
- 6 non-interference in domestic affairs

"My career as an energy systems optimization engineer started in 2006, and I had a few years of good practical experience before this 2010 UNIDO training. I obtained my CASO expert level certification and became the first South African Compressed Air Systems Optimization (CASO)... in 2016, I was contracted for my first UNIDO mission to Egypt..."

*–Albert WILLIAMS, Trainer,
Egyptian Programme for Promoting Industrial Motor Efficiency*

- 4 In 2020, qualified trainees from the Egyptian Programme for Promoting Industrial Motor Efficiency provided online support to the project management unit in Palestine and a team of national experts in capacity-building activities and assisted industrial enterprises in implementing ISO 5001 Energy Management System Implementation and Energy System Optimization projects.



- 5 Furthermore, a motor system optimization course, "MSO", led to national experts' certification and was implemented in at least 10 cases in the Moroccan industry and was held by former Egyptian trainees and South African trainers in 2023.

Achievements

Since 2010, UNIDO has delivered its tailored energy system optimization training to industry and energy practitioners worldwide. This includes optimization of motor-driven systems, industrial heating and steam optimisation processes as well as industrial cooling systems.



Energy system optimization Programme Implemented in
18 COUNTRIES



700+ EXPERTS
Qualified in different industrial energy systems



1,700+ ENTERPRISES
received training



500+ ENTERPRISES
supported with the implementation of energy system optimization measures and investments



Cumulative primary Energy savings exceed
8,500 GWH



More than
3.5 MILLION TONS
of CO₂ Emissions avoided, roughly equivalent to the emissions generated by over 750,000 passenger vehicles driven for one year

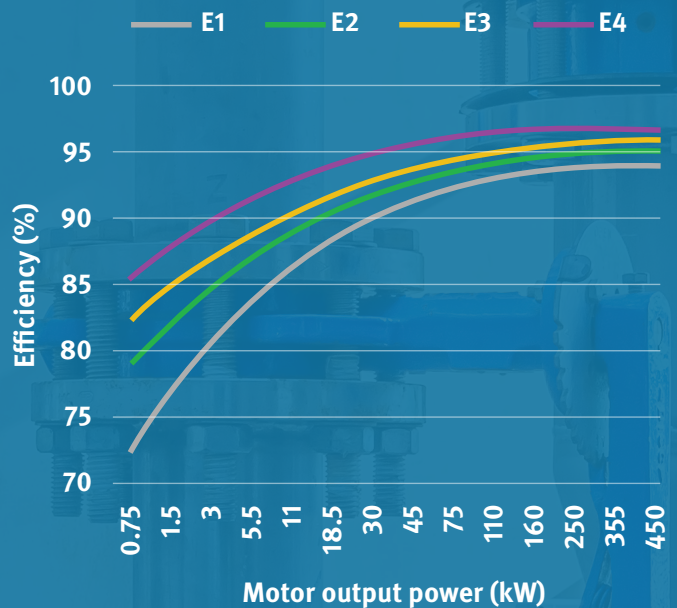
ELECTRIC MOTORS ENERGY EFFICIENCY CLASSIFICATIONS

77.5% of electric motors in Egyptian Industry are of efficiency lower than IE1.
*According to IFC STEP project 2017

Electric motors are classified according to their efficiency into the following groups:

- 1 IE1 (Standard Efficiency Motors)
- 2 IE2 (High Efficiency Motors)
- 3 IE3 (Premium Efficiency Motors)
- 4 IE4 (Super Premium Efficiency Motors)
- 5 IE5 (Ultra Premium Efficiency Motors)

EFFICIENCY FOR VARIOUS MOTORS' RATINGS ACCORDING TO IE STANDARDS



1

THE CHALLENGE

What the project aims to achieve.

An overview of the challenge:

Most industrial processes and equipment in Egypt consume **20%** or more energy than international best practices.



EDMS consume **60%** of the total industrial electricity demand in Egypt

Egypt faces the challenge of ensuring industrial growth and development while stabilizing or reducing resource inputs and safeguarding the environment. Over the last decade, industrial energy productivity in Egypt has not improved at the same rate nor received the same attention as labor and material productivity, partly because of low energy prices due to significant government subsidies. According to the “Egypt: Improve Efficiency” report of the World Bank, most industrial processes and equipment in Egypt consume 20% or more energy than international best practices. National efforts are being made to reduce greenhouse gas (GHG) emissions in different sectors, including energy, transportation, and industry.

Egypt has committed to focusing on energy efficiency and renewable energy as key mitigation measures. Specific interventions for the industrial sector include Energy Efficiency improvements and solar energy. The government of Egypt has identified energy efficiency in electric motor-driven systems (EDMS) as one of the areas with the highest opportunity to increase industrial energy efficiency while combating climate change, EDMS consume 60% of the total industrial electricity demand in Egypt.

What the project aims to achieve:

The program aims to improve the efficiency of Electric Motor Driven Systems (EMDS) and accelerate the market penetration of energy-efficient motors in the industrial sector through a range of measures including policy, financing, awareness raising and technical capacity building. The project addresses motor system improvements and replacements in industries across Egypt.

The Egyptian Programme for Promoting Industrial Motor Efficiency’s aim is to provide capacity building through conducting training sessions for

300

Industrial end users, Suppliers, and motor system optimization experts

20

Local rewinding and refurbishing workshops

2

THE SOLUTION

The methodology used that led to successful outcomes.

Which key procedures were implemented?

1. Policy Support: The project focused on developing policy recommendations to support energy-efficient motors and implementing awareness campaigns to promote adoption of EE motors.
2. Awareness-Raising Activities: The national awareness campaign aimed to educate manufacturers, industrial end-users, and the public about the benefits of energy-efficient technologies through various activities
3. Technical Capacity Building: The project trained national experts, motor system vendors, and industry staff on energy efficiency measures for Electric Motors Driven Systems (EMDS) through formal and on-the-job programs in Egypt and abroad.
4. Implementing Pilot Projects: The project supported 20 enterprises with implementing energy audits and pilots for advanced Energy Efficient Electric Motors Driven Systems (EE EMDS), showcasing benefits, and encouraging independent investment in similar projects.



Capacity Building



Information & Dissemination



Developing the ESCO Market



Policy Support



Technology Demonstrations and Transfer

5. Introducing Access to Finance: The project aimed to support the deployment of energy-efficient motors by analyzing Energy Service Companies (ESCOs), developing business plans, and fostering partnerships. ESCOs were evaluated as a sustainable financing mechanism for EE projects.

What are key goals the project aims to achieve?

The project aims to reduce GHG emissions by facilitating and supporting market penetration of highly energy-efficient motor systems in the industrial sector in Egypt through promoting policies that support the development of low-carbon technologies and mitigation options and demonstrate innovative mechanisms and solutions for technical assistance and financing. The project focuses on implementing a sustainable strategy that utilizes local value chains to meet Egypt's energy-efficient technology demand. The project will strengthen linkages between local manufacturers of energy-efficient motors and other products, suppliers, and industrial enterprises/end users.

3

SOUTH-SOUTH IMPACT

How were South-South and Triangular cooperation utilized to achieve results?

Which project elements are supported by SSTIC?

- Knowledge transfer: South African experts train Egyptians in motor, compressed air, and pump systems optimization. Egyptian trainees conducted a 2019 program in Morocco, certifying energy management experts for UNIDO's "Sustainable Energy for All" project, part of the Global Industrial Energy Efficiency Accelerator.
- Capacity building: The program provides online support to Palestine's project management unit and trains national experts. It assists industries in implementing ISO 50001 and Energy System Optimization projects.
- Knowledge exchange: Egypt's decade-long experience in industrial energy efficiency was presented at a March 2024 International Energy Agency training in Nairobi, fostering exchange with African countries.

Key SSTIC collaborations contributing to the project's success included:

- Egyptian Ministry of Industry: Facilitated project extensions and aligned with national plans.
- Egyptian National Cleaner Production Center (ENCPC) and Industrial Modernization Center (IMC): Supported policy recommendations and assisted industrial enterprises.
- General Organization for Import and Export Control (GOIEC) and Federation of Egyptian Industries (FEI): Vital for engagement.



The cost-effective motor system optimization measures and the replacement of inefficient motors expected to result in **40% REDUCTION** in energy use.

4

SUSTAINABILITY AND REPLICABILITY

How is it sustainable and replicable?

Which methods can be transferred and shared?

The Egyptian Energy Efficiency project, part of UNIDO's Global Energy Management System (EnMS) programme, offers several transferable methods



Policy recommendations for energy-efficient motors



National awareness campaigns on energy-efficient technologies



Technical capacity building for experts, vendors, and industry staff



Implementation of pilot projects for Energy Efficient Electric Motors Driven Systems (EE EMDS)



Access to finance initiatives, including ESCO analysis and business plan development

How does the outcome of the project contribute to the SDGs?

The Egyptian Programme for Promoting Industrial Motor Efficiency contributes to multiple SDGs:



SDG 7 (Affordable and Clean Energy):

- Accelerates uptake of energy-efficient motors in industries
- Improves motor systems to reduce energy consumption



SDG 9 (Industry, Innovation and Infrastructure):

- Promotes innovative energy-efficient technologies in industrial settings
- Builds capacity of local experts in motor optimization



SDG 12 (Responsible Consumption and Production):

- Encourages sustainable waste management practices for motor replacements
- Supports transition to more sustainable energy practices in industry



SDG 13 (Climate Action):

- Reduces carbon emissions through promotion of energy-efficient technologies
- Contributes to combating climate change by improving industrial energy efficiency

SSTIC Executive Summary

The energy efficiency programme in Egypt, a South-South Triangular and Industrial Cooperation initiative, is a global effort implemented by the United Nations Industrial Development Organization in collaboration with the Global Environment Facility, the Ministry of Industry and Trade, the Egyptian National Cleaner Production Center (ENCPC), and the Federation of Egyptian Industries.

The Egyptian Programme for Promoting Industrial Motor Efficiency aims to improve the efficiency of Electric Motor-Driven Systems (EMDS) and accelerate the market penetration of energy-efficient motors in the industrial sector through various measures, including policy, financing, awareness raising, and technical assistance.

The project highlights essential South-South and triangular cooperation elements, including capacity building, technology and innovation exchange, knowledge transfer, and consolidating South-South-led partnerships replicable and sustainable in other

regions. South African experts trained Egyptian trainees on motor systems, compressed air systems optimization, and pump systems optimization. The knowledge gained by Egyptian trainees was transferred to a training program in Morocco to certify energy management implementation experts under the UNIDO project "Sustainable Energy for All." Former trainees provided online support to support the project management unit in Palestine and a team of national experts in capacity-building activities and assisted industrial enterprises in implementing ISO 50001 (Energy Management System) and Energy Systems Optimization projects.

EE Motor's integrated approach, comprising policy support, awareness-raising, and technical assistance, significantly contributes to Sustainable Development Goals, particularly SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation and Infrastructure), SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action).



SCAN THE QR CODES BELOW FOR MORE INFORMATION

 **View project in UNIDO OpenData Platform** 

 **View the YouTube promotional video** 

WANT TO LEARN MORE ABOUT SSTIC?

Scan the QR code to access more information about SSTIC. You will be directed to a website or a resource that provides detailed information about the concept, principles, benefits, and examples of SSTIC in action.

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