switchmed

MED TEST II

Transfer of Environmentally Sound Technology in the Southern Mediterranean Region

Egypt

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UNIDO

UN environment
United Nations Environment Programme

MAP
Mediterranean Action Plan
Barcelona Convention

Regional Activity Centre for Sustainable Consumption and Production

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For more information on the UNIDO activities within the SwitchMed initiative, please get in touch with us at:
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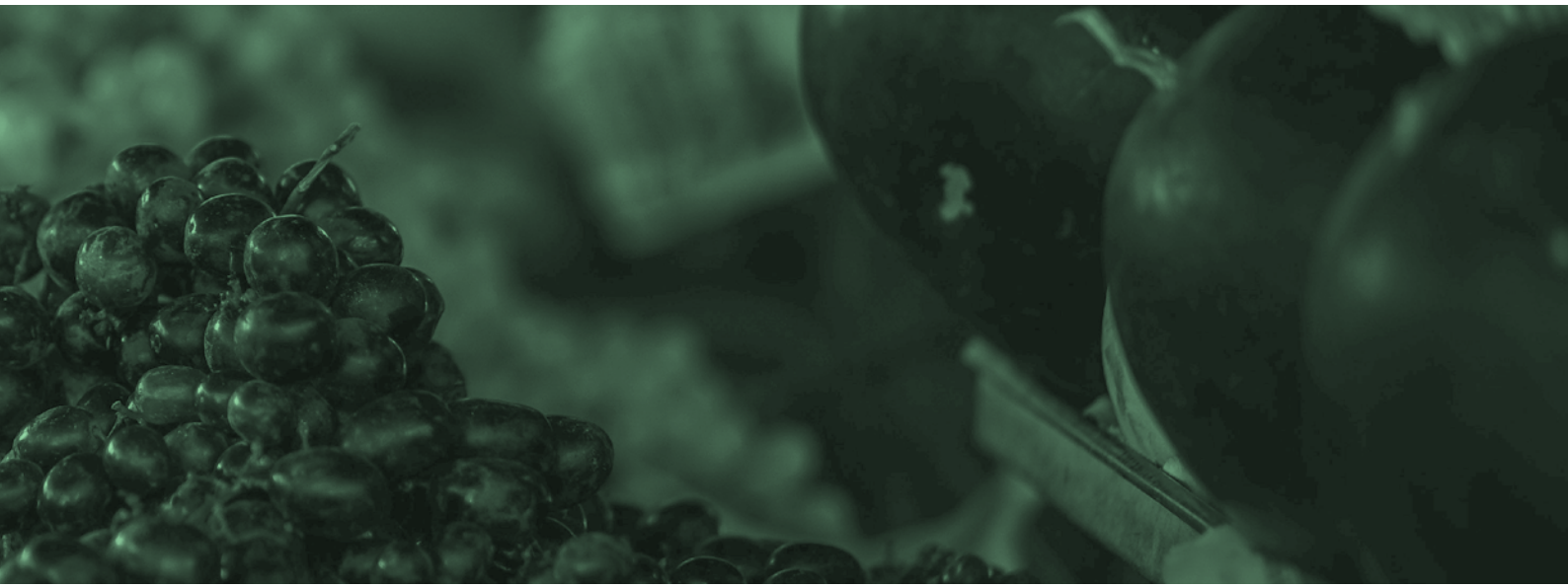
Switching to a sustainable consumption and production

The EU funded SwitchMed Program is about changing the way goods and services are produced and consumed so that human development can decouple from environmental degradation. SwitchMed strives to assist the Southern Mediterranean region to turn on the switch for Sustainable Consumption and Production (SCP) patterns and to enable the actors in this region to realize their full economic potential. The Program supports industries, emerging green entrepreneurs, service providers, civil society organizations, and policy makers through demonstration activities, policy development, and networking of incubators for eco innovations in order to catalyze progress towards low carbon and climate resilient societies and to give rise to new economic opportunities.

Turning challenges into opportunities is at the core of the MED TEST II component - a unique and innovative part of the SwitchMed Program. The Transfer of Environmentally Sound Technology (TEST) methodology from UNIDO addresses rising energy and raw material costs by demonstrating how best practices in Resource Efficient and Cleaner Production (RECP), with an attractive return on investment, can be integrated into current business operations of the Southern Mediterranean industry.

Enhancing productivity by integrating practices and technology that lead to greater efficiency in the use of natural resources, to a reduction of waste and energy consumption, and to opportunities for innovation and value creation, is central to the UNIDO TEST approach. Thus, the adoption of RECP in the business model, not only leads to better environmental performance for the industry, it also enables businesses to operate more competitively while at the same time saving money, also providing businesses the scope to invest and grow sustainably. Moreover, efficiency in production also contributes in saving valuable resources for the national economy, such as energy, water, and raw materials. Hence, the economic benefits of RECP extend far beyond the reduction of production costs for businesses, as it also contribute to additional growth, a sustained job creation, and supports the long-term resource resilience of Egypt.



Partnering for a competitive industry in *Egypt*

A growing population combined with rising costs for resources is putting Egypt in a difficult situation where a continuing economic growth and the creation of jobs are direly needed, while at the same time any additional pressure on the resource supply also must meet a growing demand in fair distribution to the growing population. This situation makes the need for a model of economic growth that can deliver both a widespread prosperity and assure a proper management of resources even more fundamental, not only to ensure the natural capital of Egypt but also to boost the productivity of the industry.

In the past, the industrial sector of Egypt enjoyed highly subsidized prices of energy and water, which created a distortion of market prices for various products. This situation did not serve a sustainable economy, and exerted additional burden on the government providing the subsidy. For the past five years, the government has started to introduce corrective measures to reduce the subsidies, as well as a flotation of the Egyptian Pound. These actions have put companies in front of the challenge to reduce existing costs while at the same time maintain their quality of their products in and maintaining their competitiveness.

The MED TEST II Program, implemented in Egypt from 2015 to 2018, addresses the challenges and the barriers national industries are facing in becoming more resource and energy efficient, non-polluting and safe, and assists in producing goods that are responsibly managed throughout their life cycle, while also increasing productivity and maintaining access to international markets with good quality products that comply with international standards.

Under the patronage of the Ministry of Trade and Industry (MoTI), and the Ministry of Environment (MoE), the MED TEST II Project in Egypt has been led by the Egypt National Cleaner Production Center (ENCPC) affiliated to the Ministry of Trade and Industry - Innovation and Technology Centers (ENCPC), in close collaboration with the Egyptian Federation Industry (EFI) (Chambers of Chemical and Food Industries), Food Export Council and Chemical & Fertilizers Export Council. The main implementing partners assisting ENCPC were EnviGlobe and EWATEC Consultants.

The TEST approach for *Egypt*

Through creative thinking and effective collaboration, the UNIDO TEST integrated approach targets all management levels of a company, involving people with different professional backgrounds and operational responsibilities, in order to enhance and sustain the efficient use of production inputs and environmental performance, encouraging a business culture where eco-innovative business solutions can thrive. Identifying each and every business potential for resource efficiency requires a systematic assessment of the company production and the set-up of an information and management system that can monitor resource use in production for the continuous improvement of the performance of the business.

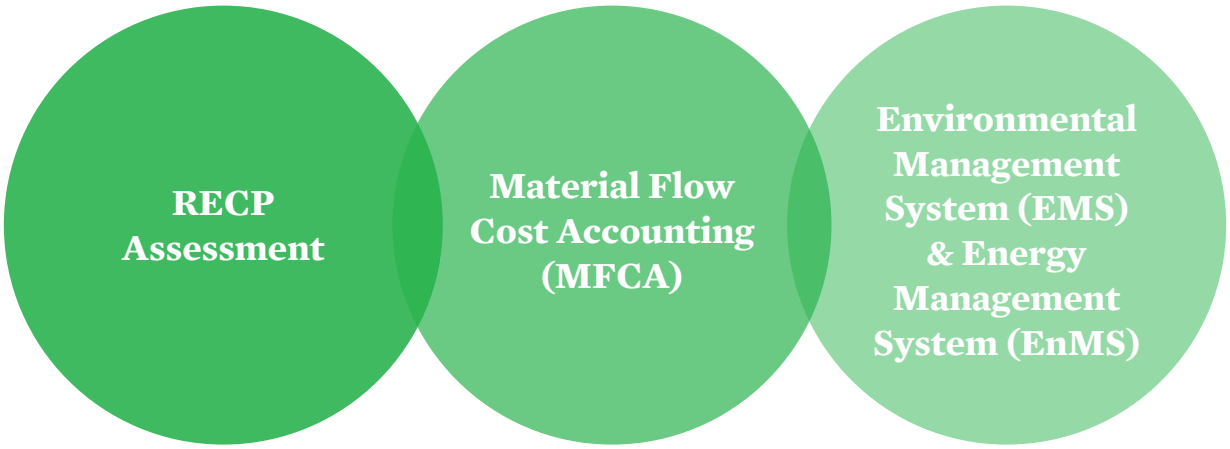
Connecting RECP assessments with present-day standards in environmental- and energy management systems, together with the material flow cost accounting standard ISO14051, enables businesses to establish an integrated system to identify and track losses in energy, water and raw material inputs. The TEST methodology builds cross-cutting understanding and capacities within various management areas of a company enabling a holistic understanding and support for RECP within the business.

« By focusing on the various aspects of each company's production processes, the UNIDO TEST methodology analyses how a business operates, what equipment is used, the number of resources that are consumed, and how waste is managed. This measures the economic and environmental impacts of each company's production and helps determine losses as it sheds light on the saving potentials with a monetary value»

Ms. Roberta de Palma,
Chief Technical Advisor - MED TEST II

The MED TEST II project in Egypt supported most of the demonstration companies by guiding them in taking the necessary steps to introduce effective monitoring systems and upgrade their existing ISO certifications.

The TEST methodology builds on the following tools:



Identifies technically and financially feasible opportunities for a resource efficient and cleaner production

Setting up an information system for tracking material losses and energy flows

Integrates resource efficiency into overall company management, leading toward continuous improvements of sustainable production patterns

Stepping up Egypt's capacities for a *green growth*

180

professionals from academia, business associations, government institutions and industries received training on the TEST tools during the demonstration phase of MED TEST II in Egypt.

One of the main objectives of MED TEST II is to strengthen the national capacity of service providers in the area of RECP to the industry and to develop the local market for sustainable production services. By the projects end in Egypt, 25 service providers from 10 technical cooperation partners and 5 additional institutions are now in a position to offer full scale RECP services according to the TEST methodology, which include the assessment of water, energy and raw material consumption, for the Egyptian industry.

To effectively transform industries in switching to a production that uses less resources and reduces pollution, calls for a change in knowledge, attitudes and practices related to resource consumption in the production. The extensive on-the-job training combined with an evidence base best-practice methodology and technical assistance program have been effective to bring the industry closer to innovative knowledge networks and practitioners with hands on experience in resource efficient and cleaner production. This will enable the MED TEST II initiative to be scaled up beyond the duration of the project to the wider benefit of the industries, also in other sectors in Egypt, and to leverage on local capacities and expertise gained through the project.

The demonstration of RECP in the Egyptian industry also gave industry professionals from the participating companies the opportunity to join in RECP trainings, forming TEST teams, and to undertake resource efficiency improvements within their own workplace. Moreover, additional expertise from industry associations, financial institutions, government administrations and academia, were also given training on the TEST methodology.

"When you talk about savings and the environmental impacts, it can easily be promoted to the industry, especially when it reflects the competitiveness of the business."

Ms. Hanan Al Hadari,
Ministry of Trade and Industry

For example, one additional service provider, who joined the TEST training, has already managed to engage four additional industries on a full commercial basis to introduce the TEST methodology in their production facilities. This indicates a growing market potential for sustainable production services in Egypt, which now can be met by a qualified offer of RECP services, thanks to the contribution of the UNIDO MED TEST II initiative.

Results of the TEST *demonstration* projects

Following an extensive marketing campaign entailing workshops and one-to-one company visits, 28 companies from the food, beverage, chemical and textile sectors were selected for the MED TEST II demonstration phase. The companies that took part in the demonstration phase range from range from SME's with 15 full time employees to large companies with 1,200 employees located in Alexandria, Cairo, and Sadat. The selected sectors for the MED TEST II project in Egypt were of particular interest because of the high "replicability" potential that the results could have to other production sites. Also, supporting these particular sectors would allow to demonstrate the business case of RECP in some of the most recognized industries in Egypt and to support them in their ambition to compete with environmentally managed high quality products that can compete on better terms in national and international markets.

"Before joining, we were wasting energy sources in areas of lighting, motors, gas or air compressors. This led not only to heavy costs of energy but also to limitation of the production capacity working against the company ambition to increase production"

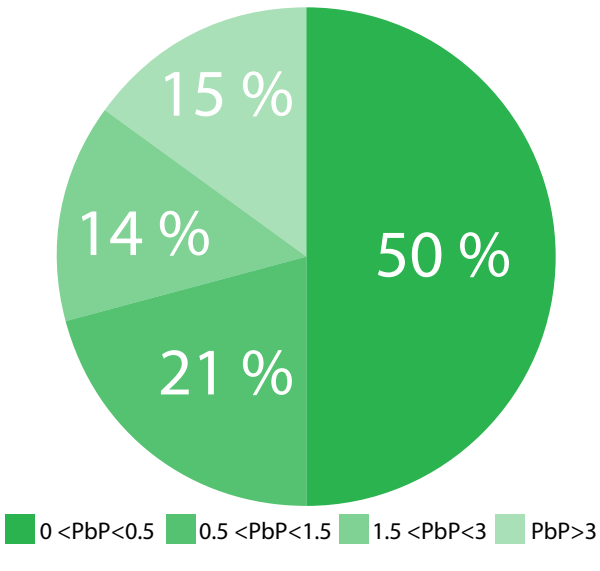
Hazem Tahon,
HSE Manager - Star Glass Company

Companies were initially motivated by the expectation that the project could help them reduce energy related production costs and also enhance the awareness of their staff about RECP. Still, significant savings in water and raw material achieved through the MED TEST II project also indicate that there is a potential for resource savings that go beyond the focus of energy. For example, the TEST methodology introduced the Material Flow Cost Accounting tool (MFCA) as one of the major innovations. The MFCA analysis revealed to the company the real cost of raw material losses and inefficiencies.

Through the TEST approach, both monetary and volume data related to production losses have been compiled leading to the "finance" and "technical" company staff working together. This results in putting a price tag on the losses and shedding light on the economic savings potential. Analysis of the data showed that while companies are aware of their energy costs, often underestimate the costs resulting from material losses and do not have an information and management system to trace where these losses are occurring within the process. TEST approach helps the plant to identify and select the critical areas in which to focus its efforts to identify sources of inefficiency and improvement measures.

The demonstration projects in Egypt revealed that there indeed is a potential for RECP within the industry and that valuable savings both for the companies as well as for the national economy can be achieved, sometimes by introducing small measures that also have a short payback period (PBP) on the investment. The majority of the identified measures in Egypt had a PBP of less than half a year (50 %), showing the high profitability of resource efficiency.

Pay-back period of identified measures at the demo companies



Results of the TEST *demonstration* projects

The table below summarizes the financial and environmental indicators of the total identified measures in 26 demonstration companies.*

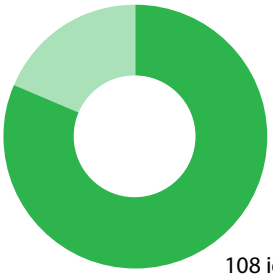
Company	No. of employ-ees[1]	Investment Euro	Savings Euro / yr.	Avg. PbP yr.	Water % / yr.	Material % / yr.	Energy % / yr.
Chemical sector							
ABCO United Plastics & Chemicals[1]	1,000	283,269	178,925	1.6	46 %	-	27 %
Alexandria Company for Industrial Packages (ACIP)[2]	240	21,689	22,648	1.0	49 %	-	1.8 %
Alexandria Detergents and Chemicals Company (ADCO)[2]	300	64,428	101,663	0.6	17 %	-	7 %
Alexandria Mineral Oils Company (AMOC)[1]	200	18,121,320	2,589,758	7.0	84 %	-	19 %
Bariq[1]	153	358,000	981,962	0.4	88 %	10 %	11 %
El ABD Company[2]	33	1,975	1,709	1.2	-	-	42 %
Future Pipes[1]	550	301,823	656,728	0.5	-	88.8 %	5 %
Pharmaplast Company[1]	15	33,295	13,799	2.4	-	19 %	11 %
Sphinx for Glass Company[1]	330	53,103	43,797	1.2	3.7 %	-	2.8 %
Star Glass[1]	350	5,011,500	797,369	6.3	-	-	54.7 %
Swiss Egyptian Company for oral care products & cosmetics (SESIC)[2]	250	1,460,050	369,591	3.9	5 %	-	20 %
Tiger Coatings[1]	35	23,525	5,423	4.3	-	-	23.5 %
Food and beverage sector							
Arab French Company-SAVENCIA Fromage & Dairy (AFDL Milkana)[1]	250	52,890	93,341	0.6	29 %	0.5 %	24 %
Borg El Arab for Industry[1]	30	80,800	155,744	0.5	90 %	0.2 %	13.9 %
El Dawlya For Juice[2]	220	86,388	111,165	0.8	25.3 %	-	8.8 %
El Magd Company for Food Industry (Sonbola)[1]	24	6,238	12,346	0.5	5 %	0.36 %	43 %
El Marwa for Food Industries[2]	120	333,270	144,204	2.3	52 %	1 %	5 %
El Sakr Company[1]	100	331,958	287,637	1.1	54 %	4 %	14 %
ICAPP Company[1]	750	54,000	34,322	1.6	-	-	17 %
International Company for Agricultural Dev. (Farm Frits)[1]	1,200	13,000	115,000	0.1	33 %	-	4 %
Misr Cafee Company[2]	1,200	341,400	220,573	1.5	1.9 %	-	18 %
NCMP Company[2]	836	221,500	489,762	0.5	46 %	-	21.2 %
Oil Tec for Oils & Detergents[2]	420	1,054,150	902,973	1.1	46 %	-	81 %
Orion for Food Industries[1]	150	291,182	289,449	1.0	66.8 %	1.8 %	27 %
Saudi-Egyptian Company for Salts and Minerals (SecoSalt)[2]	400	7,539,500	1,640,018	4.6	38.5 %	-	73.6 %
Textile sector							
El Askary Dott Jeans[1]	500	122,000	80,402	1.5	-	5 %	29.9 %
TOTAL	**9,656**	**36,262,253**	**10,336,162**	**3.5**			

*Two companies declined to publish their results from the MED TEST II project.
(1) Cost savings compared to the production year 2015
(2) Cost savings compared to the production year 2016

RECP a *vantage point* for Egypt's industry

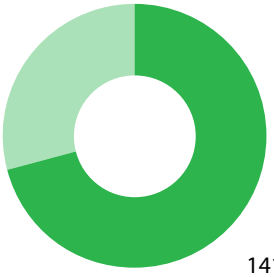
A total of 255 resource efficiency measures were identified by the TEST team in the 28 demonstration companies. Of these, 192 measures, corresponding to approximately 77% of the total measures, were approved by management in these companies and included in the action plan for implementation in 2018.

Chemcial sector:



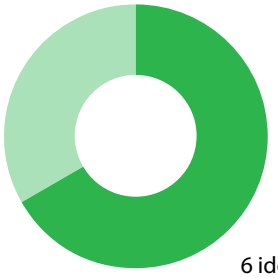
108 identified
88 accepted

Food and beverage sector:



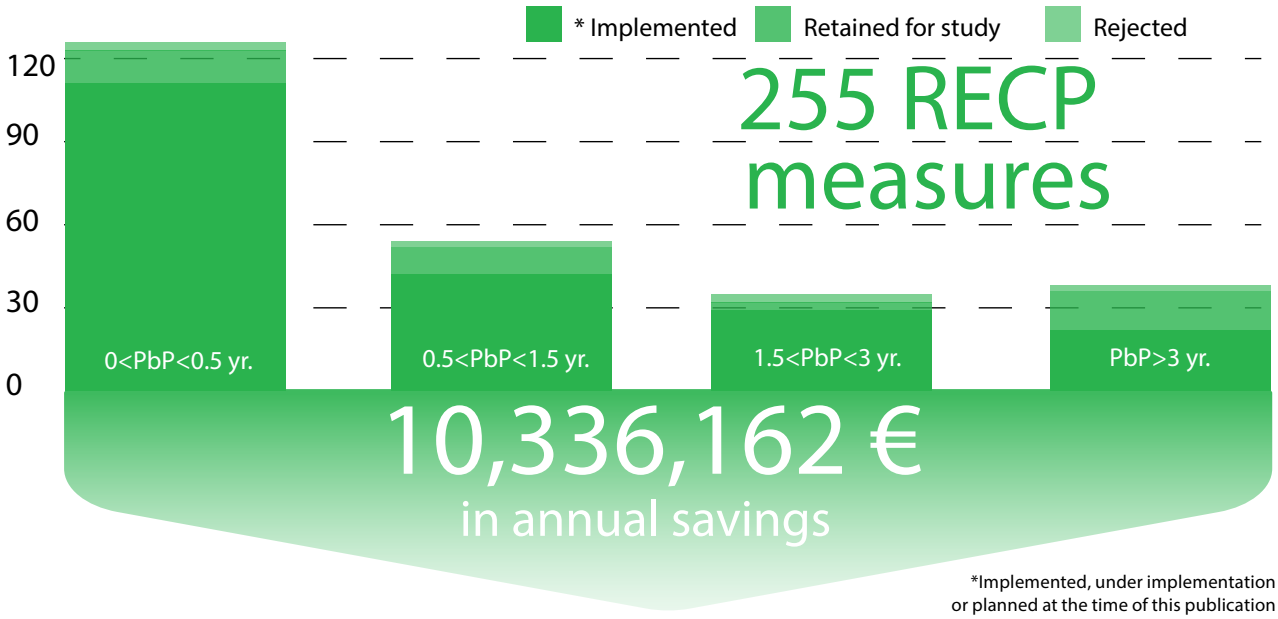
141 identified
100 accepted

Textile sector:



6 identified
4 accepted

Distribution of identified measures by pay-back period and implementation rate in the Egyprian demonstration companies



*Implemented, under implementation or planned at the time of this publication

In the 28 plants a potential annual savings of over 10.3 million euros were identified, resulting in energy savings of 411,049MWh/year; water savings of 2,020,608 m³/yr.; 12,246 t of raw material savings, and 12,188 t of landfilled solid waste avoided.

Annual reductions of resources and emissions:

Water savings	Energy savings	Reduction of CO_2 emissions	Solid waste reduction
2,020,608 (m³/year)	411 (GWh/year)	79,452 (t/year)	12,188 (t/year)

An opportunity for the *industry and environment* in Egypt

"Resource efficiency provides tremendous opportunities for Egyptian companies to become more competitive. This is an interesting business proposition as it is not only about becoming Green - it is simply common business sense".

Mr. José Luis Bobes,
Team Leader, GEEF

In order to respond to the sometimes high investment that new resource efficient technologies require, companies have in the MED TEST II project been given guidance on how to access the existing green financial incentives that have been developed by the Green Economy Financing Facility (GEFF), or the Egyptian Pollution Abatement Programme (EPAP III) as part of its strategy to develop green financing in Egypt. In this regard, one company has been enabled to finance RECP investments amounting over 17 million euros through the EPAP III program. In addition, four companies are preparing to apply for the GEFF with investments exceeding 7.5 million euros, and two companies are preparing to apply for the EPAP III with investments amounting to 450,000 euros.

Similarly, companies are now encouraged to incorporate the TEST approach into their policies, strategies and future business strategy. As a result, some of the demonstration companies have adopted environmental policies that incorporate the concept of the RECP in their current business strategy, from which they will continue to profit from. All the companies prepared their EMS policy statements and were provided with specific guidelines to integrate RECP in their management system and towards the end of the project, three companies have decided to upgrade their existing ISO 14001 certification, and five companies started in ISO 50001 certification. During the Project implementation, one of the companies conducted an assessment for its water footprint and is now able to manage and monitor its water consumption more efficiently.

"For any business, there are always drivers for cost. And the MED TEST II program drives efficiency and costs. So, it benefits us completely in all KPIs that we want to drive."

Mr. Martin Lomas,
Manufacturing Director
Juhayna Food Industries

Competences *for RECP* in Egypt

To share our vision of a system wide change towards sustainable consumption and production in the Southern Mediterranean requires the efforts of all society actors. The MED TEST II demonstration project in Egypt has revealed how additional economic and environmental benefits can be gained from the RECP approach by using the integrated methodology of TEST - without interfering in the business operations of the industries!

Moreover, UNIDO have together with stakeholders from the industry and government institutions developed a roadmap on how to scale-up the RECP approach throughout the industries in Egypt and how to build additional capacities that could reinforce the supply and demand in sustainable production services. The results from these consultations will be published in a national roadmap for scaling-up RECP in Egypt.

National Team

Core TEST Team: Ali Abo Sena (Director ENCPC), Ayman ElZahaby (TEST Technical Manager and Team leader), Maysara Fouad (National Project Coordinator, RECP Expert), Fatheya Soliman (Team leader, RECP Expert), Samia Massoud (Team leader, RECP Expert), Osman Aita (EMS Expert), Nabil Bakry (EMS Expert), Ahmed Tawfik (MFCA Expert), Nagwa Monsef (RECP Expert), Mohamed Sherif (Energy Efficiency Expert), Ahmed Mahmoud (EE Expert), Tariq Ismail (EE Expert), Shadia Elshishini (Policy Expert).

Supporting Technical Team: (ENCPC): Mostafa Moghawry, Ayman El Saeid, Khaled Abdeen and Mohamed Salem. (EWATEC): Mai Ibrahim, Nermin Ibrahim, Hend El-Wakeel and Dina Nagi. (EnviGlobe): Abd Allah Quortam, Dina Hussein, Yosri Abo El-Naga Abd El-Rahman Sayed.

International Team

Carolina Gonzalez-Mueller (Project Manager), Roberta De Palma (Chief Technical Advisor), Vladimir Dobes (Senior TEST Expert), Christine Jasch (MFCA Expert), Jaap Van Der Meer (International sector expert), Karsten Ollesch (International sector expert) Bo Kuraa (International energy efficiency expert), Bruno Vincent (International sector expert), Vojislavka Satric (International sector expert), Chris Arvanitakis (International sector expert), Michael Barla (Communication Specialist), Vladimir Anastasov (Headquarters Project Coordinator).

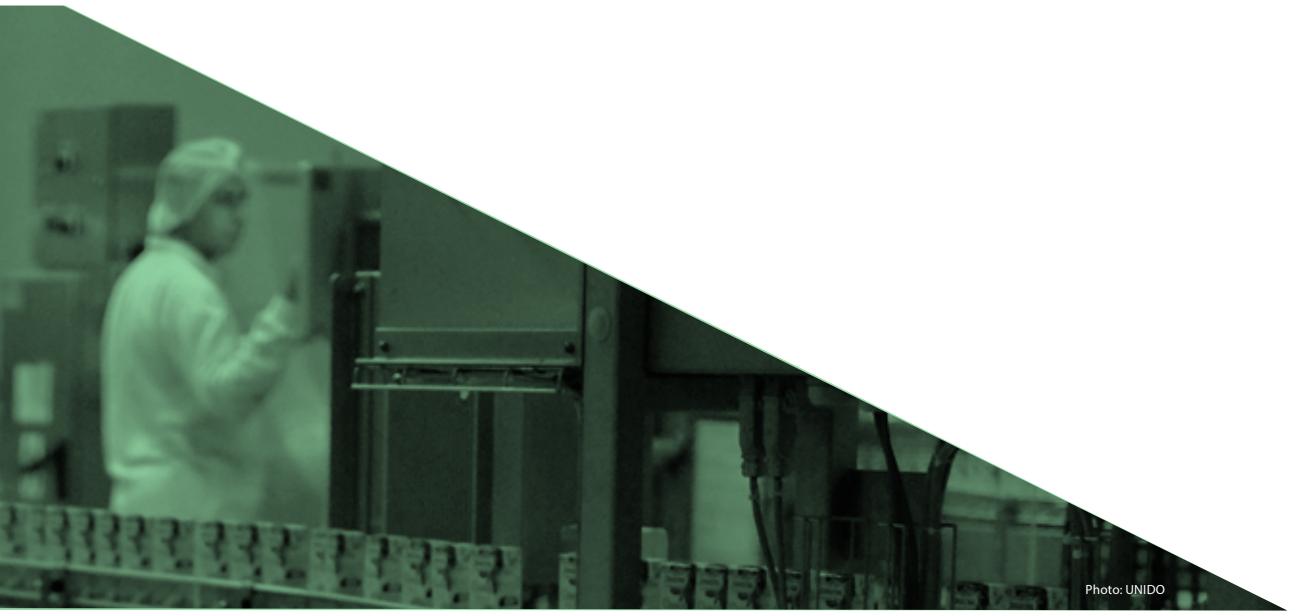


Photo: UNIDO

Implementing partners

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