

As part of the SwitchMed programme, UNIDO supports industries in the Southern Mediterranean through the transfer of environmental sound technologies (MED TEST II) to become more resource efficient and to generate savings for improved competitiveness and environmental performance.

Egypt

Misr Café Company

Food and beverage sector

Context

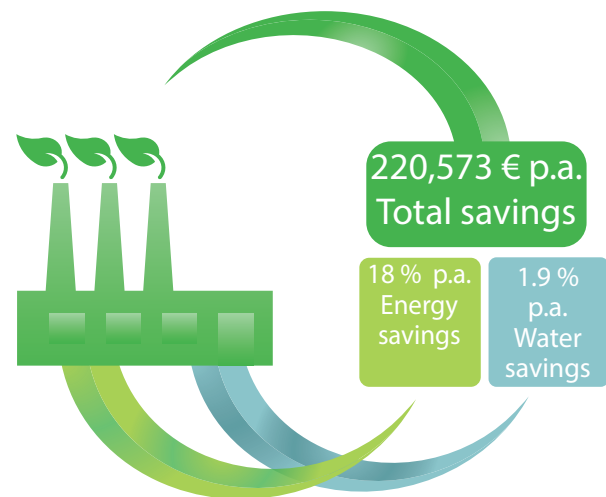
Number of employees:	1,200 full-time employees
Key products:	Instant and Arabica coffee, flavored tea and hot drinks
Main markets:	Local and international
Management standards:	ISO 9001 ISO 22000 ISO 18001 ISO 14001

Misr Cafe Company is the first company in Egypt and the Middle East specialized in the production of instant and roasted coffee from Robusta and Arabica coffee blends. It is located in 10th of Ramadan City, Industrial Zone A1 and has more than 1,200 full-time employees. The company complies with environmental and industrial regulations and has quality management systems in place (ISO 9001, ISO 22000, ISO 14001, and OHSAS 18001). Misr Cafe is a private shareholding company established in 1984. Its head office is located in Cairo. Misr Café specializes in producing instant coffee products.

“Due to the significant increase of energy costs in Egypt and the rise of green house gas emissions we all should optimize our energy consumption to save the environment and to stay competitive in the market”

Eng.Khaled Al Naggar
HSE Manager - Misr Cafe

Benefits



Graphic: UNIDO

The MED TEST II project identified total annual savings of 220,573 euros mainly in connection with energy use, with an estimated investment of 341,400 euros. The average payback period is 1.5 years. A total of eight energy efficiency measures were identified during the project with the active support of the internal company team. All identified measures were accepted by the top management for implementation.

Energy consumption will be cut by 18%, reducing CO₂ emissions by a total of 2,825 t, while water consumption will be reduced by 1.9%. The project identified a new investment project for waste to energy valorization of the spent coffee grounds, which will enable the company to replace part of its fossil fuel based energy sources with a renewable energy source.

Saving opportunities¹

Action	Economic key figures			Resource savings & environmental impacts per year		
	Investment euros	Savings euros / yr.	PBP years	Water and raw materials	Energy MWh	Pollution reduction
Compressed air system optimization	13,900	14,132	1	-	367	Total: 2,825 t of CO ₂
Steam system optimization	25,000	32,051	0.8	3,060 m ³ of water	2,035	
Good housekeeping measures	2,500	4,020	0.6	3,400 m ³ of water	80	
Spent coffee grounds as biomass fuel	300,000	170,370	1.8	-	11,111	
Total	341,400 €	220,573 €	1.5	6,460 m³ of water	13,593 MWh	

¹ Numbers based on production value from 2016

Compressed air system optimization

The company has eight compressors with a total power of 540 kW, which are operated at 7 bar with a relatively high load. The measurements revealed that the high load is in fact not due to the process demand but to the very high level of air leakage. Also, the compressor system has a manual drain system for draining the accumulated water. Fixing air leakages and introducing an automatic water drain system for the compressors will reduce energy use. Moreover, compressed air consumption is driven by several inappropriate uses such as cleaning or cooling operations, which can be eliminated by using the appropriate equipment instead.

Steam system optimization

A very high level of leakage was detected in the company steam system. The thermal camera measurements revealed that the steam pipe network is very poorly insulated. In order to increase the efficiency of the boilers, the opportunity to recover heat from the condensate of the spray dryers for preheating the boiler feed water was identified. Moreover, preheating the combustion air will improve combustion efficiency and reduce gas consumption.

Good housekeeping measures

Misr Café has initiated several awareness raising activities targeting staff members to improve the use of resources. It is planned to establish a new company for providing incentives for staff who are responsible for managing resources efficiently. During the project, many good housekeeping measures were developed, such as:

- Avoiding the use of compressed air for cleaning equipment and cloths
- Collecting used hot water and using it for preheating instead of sending it down the drain
- Switching off all lights when they are not required

Spent coffee grounds as biomass fuel

Spent coffee grounds contain large amounts of organic compounds including fatty acids, amino acids, polyphenols, minerals and polysaccharides that justify valorization of this waste material flow. By installing a biomass boiler using the spent coffee grounds as a fuel, the company will reduce consumption of natural gas. This measure will also reduce generation of solid waste by 6,000 t/year and energy consumption by 40,000 GJ/year. Annual CO₂ emissions will also be reduced by approximately 2,200 t.

“The MED TEST II team did a very good job. They visited our facility many times, made field measurements for electric and thermal energy users and generated applicable options. Our team has already started with the implementation and we intend to sustain the project methodology within our team and processes.”

Eng.Khaled Al Nagggar
HSE Manager - Misr Cafe

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