MED TEST II Case Study

switchmed

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.

Jordan

Bahaa Eldeen Al-Bustanji & Partners Co.
Food and beverage sector

Context

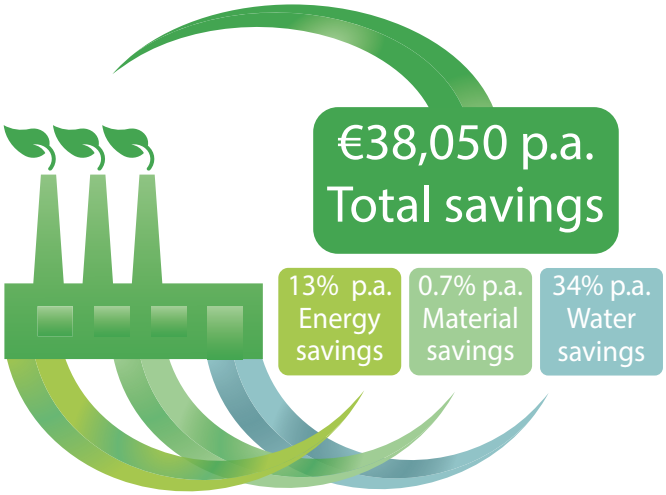
Number of employees:	45-50
Key products:	Halva and Tahini
Main markets:	Local & International
Management standards:	ISO 22000

Bahaa Eldeen Al-Bustanji & Partners Co. is a small-sized enterprise that was established in 2014, producing Halva and Tahini for the local, regional and international markets. The company participated in the MED TEST II project to reduce production losses and costs through a more efficient use of resources (mainly water), achieve environmental compliance and to train its employees in resource efficient and cleaner production (RECP). During the project's implementation period, the company has certified for ISO 22000 (April 2017).

"We were looking for real solutions that could help us to save water and energy in the production line and give us a competitive edge. A methodology that can qualify the management and the team to identify the best practices of how to deal with raw material in our business operations was also an incentive for joining the project."

Dr. Allayth Aldrabee,
Development and Export Manager

Benefits



Graphic: UNIDO

The MED TEST II project identified total annual savings of 38,050 euros in energy, water and raw materials with an estimated investment of 21,980 euros. The average pay back period is 0.6 years, and more than 92% of the identified measures were accepted for implementation by top management.

Material consumption will be reduced by 0.7%, energy consumption by approximately 13% and water use by 34%. Additionally, CO_2 emissions will be reduced by 11% and solid waste by 2%.

The company also issued its EMS policy statement and was provided with a guideline for establishing an RECP integrated EMS system. 13 saving options resulted from the project for reducing energy (electricity and fuel), water and raw materials consumption.

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Saving opportunities[1]

Action	Economic key figures			Resource savings & Environmental impacts per year		
	Investment euros	Savings euros / Yr.	PBP Yr.	Water & Materials	Energy MwH	Pollution reduction
Washing, reuse and cleaning protocols for water & materials conservation	€7,730	€6,400	1.2	2,079 m^3 Water and 3.8 tons Raw materials	-	Total: 86.2 tons CO_2 2.2 tons Solid waste
Reduction of sesame losses	€1,330	€3,140	0.4	2.2 tons Raw materials	-	
Lighting and compressed air system	€3,980	€1,580	2.5	-	15	
Steam system	€6,670	€24,590	0.3	17 m^3 Water	240	
Cooling system	€ 2,270	€ 2,340	1.0	-	23	
TOTAL	**€21,980**	**€38,050**	**0.6**	**6.0 tons Raw materials 2,096 m^3 Water**	**278 MwH**	

1 Numbers based on production value from 2015

Washing, reuse and cleaning protocols for water & materials conservation

Adding the salt to the washed sesame after the draining process will reduce the quantity of salt used and also the salt content in the washing water. This has resulted in salt-free washing water, which can now be circulated for longer period without the need for immediate rinsing. The risk of bacterial contamination is low, as the bacteria are eliminated during the roasting process. The shells and all fine particles must be washed off, providing an effective sieving process on the line was identified as essential and this is also necessary to protect the washer nozzles from blocking. The pressure outlet of the circulating pump can be used to supply the high pressure water for COP pre-cleaning of the equipment.

Reduction of sesame losses

Sesame seeds are fed into a series of sieving and screening stages at the start of the process to remove small seeds, peels and raw material soiling to improve product quality. In this measure the sieving sheet dimensions (slits size) have been modified to reduce the losses of small sesame seeds. This has no effect on the final product quality but reduces the solid waste by 2-3%.

Lighting and compressed air system

Inefficient CFL lamps, spot Halogen lamps and MH & HPS flood light fixtures are recommended to be replaced by efficient LED bulbs, spot and flood light fixtures to reduce electricity consumption. It was found that the compressor power consumption is unacceptably high in the set pressure range; upgrading and maintenance should thus be implemented. Relocating the air compressor to end users will reduce the air pressure requirement by 1 bar, since the existing air pipes are too long and cause pressure losses in the distribution network.

Steam system

The steam boiler efficiency could be improved by reducing the stack temperature through regular cleaning of the external and internal surfaces of the steam boiler to increase the heat transfer rate; as also by improving regulation adjusting the excess air rate. Insulation of the steam network (steam pipes, condensate tank and end-users) and a leak inspection program will substantially reduce fuel consumption in the boiler and steam network.

Cooling system

Operation of the chillers can be optimized by segregating the air suction from warm areas, increasing condenser air suction area by fixing its metallic cover, periodic cleaning of condenser air filter and insulation of chilled water network.

"After our participation in the project, we not only welcome the measures to reduce water consumption but have also seen that many measures can be implemented to slash our energy (electricity and fuel) consumption. Moreover; the MFCA assessment that was carried out has improved our knowledge of the NPO costs and has upgraded our accounting and information system."

Dr. Allayth Aldrabee,
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