

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.

Lebanon

Chamsine Bakeries Co.

Food and beverage sector

Context

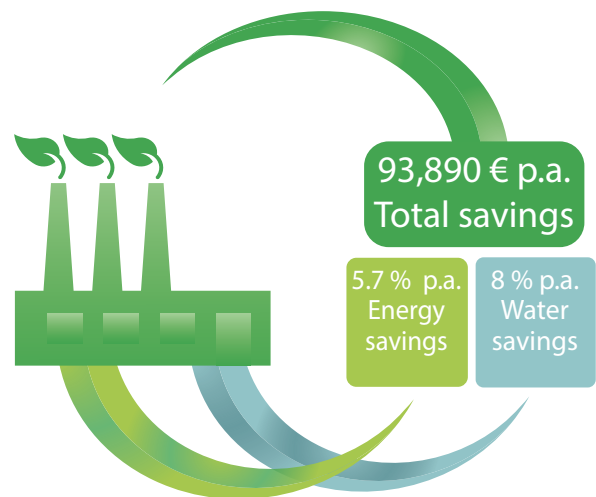
Number of full time employees:	150
Key products:	Arabic bread, French bread, pastries, and cakes
Main markets:	local

Chamsine Bakeries Co. is a Lebanese company established in 1980. It evolved from a small family business to a large size industrial enterprise thanks to its long term strategy for growth. Its products include Arabic and French bread, pastries, cakes, and ice-cream for the local market. Chamsine Bakeries has over 10 branches all over Lebanon with two main production sites namely in Khaldeh and Damour where around 45,000 t of bakery products are produced annually.

“Our concern is to provide quality products while minimizing our production costs and this is why we joined MED TEST II. In 2016, our energy consumption for both the Khaldeh and Damour sites was around 29,000 MWh while our water use was approximately 60,000 m³. Our CO₂ emissions resulting from operations in both sites exceeded 13,000 t while our energy bill exceeded 1.3 million euros.”

Issa Al Kadery, Manager
Chamsine Bakeries Co.

Benefits



Graphic: UNIDO

The MED TEST II project identified total annual savings for the Chamsine production sites at Khaldeh and Damour amounting to 93,890 euros in energy, water, and raw material requiring an estimated investment of 73,438 euros, resulting in an average pay back period of less than 1 year.

Out of a total of 21 resource efficiency measures identified and approved by the company, 17 have already been implemented and 2 are under implementation.

The high rate of implementation is an indication of commitment to implement a resource efficient and cleaner production (RECP) in the facilities. The company installed an information system at the start of the project in both the Khaldeh and Damour sites including 103 metering points for water, energy and operational hours for a total investment of 12,000 euros.

“The project led to many behavioral changes within the company. Our aim for the future is to keep the momentum imparted by the MED TEST II project and embed the culture of resource efficiency in our company”

Issa Al Kadery, Manager
Chamsine Bakeries Co.

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
Install second stage for RO systems (Khaldeh site)	26,068	10,503	2.5	4,758 m ³	-	Total: 555 t CO ₂
Optimize generators load management (Khaldeh site)	0	10,952	-	-	278	
Optimize air fuel mix for Arabic bread ovens (Khaldeh/Damour sites)	0	46,618	-	-	1,184	
Compressed air system (Khaldeh/Damour sites)	400	2,379	0.2	-	55	
Variable speed drives for ventilation blowers and fans (Khaldeh/Damour sites)	43,500	13,280	3.2	-	329	
Good housekeeping measures	3,470	10,158	0.3	-	273	
Total	€73,438	€93,890	0.8	4,758 m³	2,119 MWh	

¹ Numbers based on production value from 2016-2017

Install second stage for RO systems

The RO system installed at Khaldeh is a single stage with an efficiency of 45%: adding a second stage RO will improve system efficiency by 72% saving some 4,700 m³ of water annually. The expected increase in electricity consumption will mostly be compensated by a reduced system operating time.

Optimize generators load management

The company has two electricity generators of 700 and 500 KVA at the Khaldeh site. Electricity generation at the site is responsible for approx. 45% of primary energy consumption in summer and 25% in winter with an average of 38% on annual basis. In winter the electricity load decreases due to reduced cooling demand for air conditioning and production (the ice cream department is not operating).

Switching to the smaller electricity generator during winter, instead of the larger one, has resulted in savings of some 20,000 liters of diesel per year.

Optimize air fuel mix for the Arabic bread ovens

The tunnel ovens used to produce Arabic bread at the Khaldeh and Damour sites absorb respectively 71% and 83% of final energy. Optimal adjustment of the air-fuel mix at the tunnel burners for the ovens will save no less than 114,000 liters of diesel fuel with a cost saving of 47,000 euros with practically no investment required.

Compressed air system

Compressed air lines develop leaks over time and it is thus important to inspect compressed air network for leakages on a regular basis. This measure should result in an air compressor operating time reduction of 10%.

Air compressors at the Damour site are located in a confined space and air intakes are somewhat close to the chimney outlet of a tunnel oven. Both of these conditions affect air compressors efficiency. Providing air duct ways with openings at a higher level for the purpose of channeling fresh air to the compressors for cooling and air intake purposes, could improve air compressors efficiency by 7%.

Variable speed drives for ventilation blowers and fans

Ventilation fans and blowers are often operated at full speed when only partial load is needed; better demand management could be achieved by varying the speed of the fans and blowers when partial load is possible, this will be an effective and sensible step for cutting the electricity bills. This measure could reduce ventilation equipment electricity consumption by 20% bringing estimated electricity savings of 13,280 euros with a payback period of 3.2 years

Good Housekeeping measures

A number of good housekeeping practices have been implemented by the company such as shutting off equipment when not needed, cleaning of combustion chambers of rotary ovens, cleaning air filters and upgrading insulation of equipment and pipes, which will annually save around 10,000 euros.

For more information, contact:



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