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.

Lebanon

Dirani Group

Food and beverage sector

Context

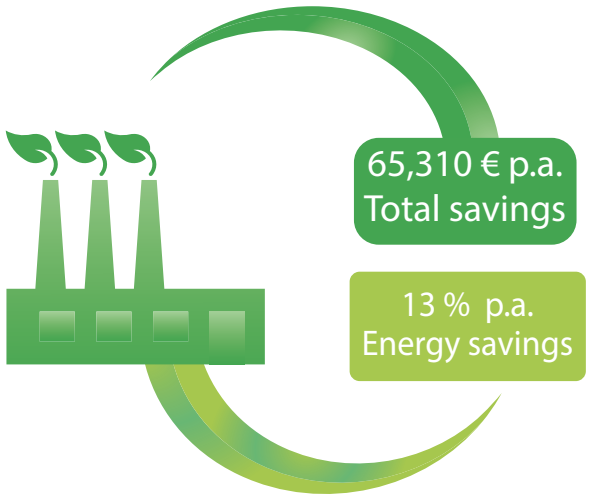
Number of full time employees:	350
Key products:	pickles, syrups, olives, jams, cakes, juices, halva
Main markets:	local and intetnational
Management standards at the project beginning:	ISO 22000:2005

Dirani Group was established in Lebanon in 1979. Its main activities are in the food sector with secondary activities in home sanitation products like soap and detergents. In 2015, the company produced 13,700 t of various food products, mainly syrups, processed olives, jams, pickles, vine leaves, packaged dates, cakes, spices, halva, and natural juices. Dirani products are sold under its own brand name (Dirani). The manufacturing facilities located in Qsarnaba are steadily growing as a result of the long term expansion strategy.

"Before joining the MED TEST II Project, we were seriously planning and taking action to reduce resource consumption. The UNIDO project came at the right time. The turning point for us was when the monetary values of our production inefficiencies were quantified and concrete propositions were made on how to reduce them"

Ahmad Dirani,
General Manager

Benefits



Graphic: UNIDO

As result of the MED TEST II Project, five measures for energy savings that will reduce the energy bill by 13% were implemented. The estimated annual savings are 65,310 euros based on an investment of 157,500 euros with an average payback period of 2.4 years.

Using the material flow cost accounting (MFCA) tool of TEST approach, the company realized throughout the Project that there is good potential to make savings by reducing losses of raw material in the production process. Furthermore, the company implemented an information system for monitoring energy and water use for a total investment of 60,000 euros. This system will be further automated in the near future to obtain real time information and optimize production costs.

The company staff is now much more aware of concepts for resources efficiency, because of the close interaction with the MED TEST II team over the last 2 years.

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SwitchMed is funded by the European Union

Saving opportunities[1]

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
Improving steam system efficiency	2,500	18,228	0.1	-	656	Total: 406 t CO_2
Replacing the use of electricity with steam for olive browning	5,000	2,831	1.8	-	62	
New electricity generators with synchronizer board	150,000	44,251	3.4	-	870	
Total	**€157,500**	**€65,310**	**2.4**	**-**	**1,588 MWh**	

1 Numbers based on production value from 2016 - 2017

Improving steam system efficiency

Steam boilers use 75% of final energy supplied the plant. The project analysis showed that any improvement of boiler performance will positively impact the energy bill.
Periodic cleaning of boiler heat transfer surfaces can reduce annual energy consumption by 210 MWh and energy expenditures by 5,600 euros.
Regular control and adjustment of steam boilers burners' will cut the annual energy consumption by 315 MWh.
Insulating the inspection hatches of boilers as well as connections to control devices installed on boilers can reduce energy consumption by 131 MWh.

Replacing the use of electricity with steam for olive browning

The browning process uses electricity as a source of heat to speed the oxidation of olives. The company decided to use steam for heat generation instead, since it is more efficient and environmentally friendly saving 62 MWh of electricity per year.

"Thanks to the project, we achieved energy efficiency improvements in two years that otherwise would have taken us a decade to accomplish without this support."

Ahmad Dirani,
General Manager

New electricity generators with synchronizer board

The 1000 KVA generator has largely exceeded its service life requiring frequent maintenance and overhaul with associated costs. Moreover, it is being operated over extended periods of time at very low load factors. This combination of operating conditions results in high energy consumption.

During monitoring of the operating data, the results have shown that the existing 1000 KVA generator average efficiency does not exceed 21%. Efficiencies of at least 36% can be attained employing standard operating conditions with new generators equipped with load sharing synchronizer board.

The company is considering investment in a new generator, comprising 3x350 KVA sets with a synchronizer board to replace the 1000 KVA generator. This measure can help the company achieve a reduction in annual energy consumption equivalent to 1,508 MWh

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