

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

HMBR Manufacturing and Trading CO S.A.L Food and beverage sector

Context

Full time employees in the production:	382
Key products:	PAIN D'OR: Arabic bread, pastries, French bread, specialty bread, cakes, chocolate, ice cream. FANTASIA : Natural potato chips, Tortilla chips, pellets and extruded corn chips
Main markets:	local

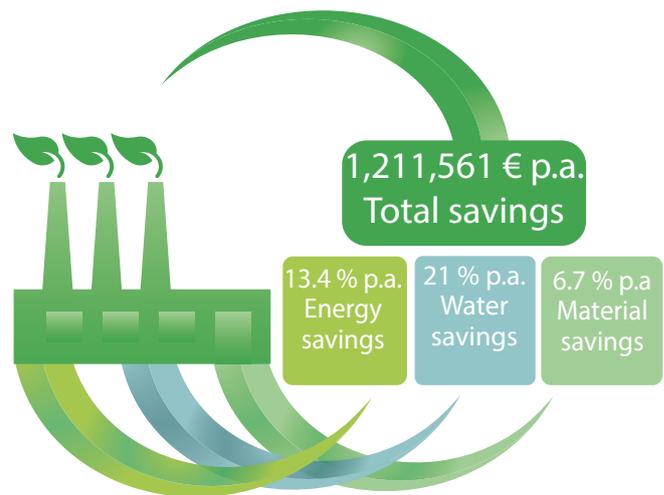
HMBR Manufacturing and Trading CO S.A.L is a Lebanese company founded in 1993; it is organized into two separate factories named FANTASIA and PAIN D'OR located in the same production area in Choueifat. FANTASIA produces different types of potato chips with a total production of 5,236 t/year, while PAIN D'OR produces numerous types of bread, baked goods, ice cream, and chocolate with a total production of 9,369 t/year.

The company was motivated to join MED TEST II to identify opportunities for increasing resource efficiency and reduce operational costs of production, thus ensuring the long-term environmental and economic sustainability of its operations.

“HMBR Manufacturing and trading CO S.A.L spends more than 20 million euros/year on resource input for its production lines out of which 2 million euros meet our energy demand of 26,500 MWh. The energy consumption resulted in no less than 8,600 t of CO₂ emissions. Water demand exceeded 90,000 m³. These are the main drivers for joining the MED TEST II program - to ensure the sustainability of our business operations.”

Marwan El Koussa,
Chairman of the Board of Directors and Owner

Benefits



Graphic: UNIDO

A total of 29 measures were identified under the MED TEST II project, out of which two are already implemented, six are under implementation, and 21 are under study. The total annual savings are in the range of 1,211,561 euros with an investment of approximately 1,002,441 euros. A major environmental outcome of the selected interventions is the annual reduction of CO₂ emissions by approximately 1,875 t.

With a 45,000 euros investment, products returns from the market are expected to be reduced by 2% for Pain D'Or and 0.5% for Fantasia. This will save 492 t of raw material, besides energy and water, resulting in annual savings of 856,000 euros.

Investing 12,000 euros in electricity, water, run hours and fuel meters, HMBR Manufacturing and Trading CO S.A.L has greatly benefited from the information system that was installed at the start of the project. Currently, readings from 91 measuring points are made day in, day out while before the project only 3 measuring points existed.

Saving opportunities¹

¹ Numbers based on production value from 2016 - 2017

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
Reducing market returns from clients	45,000	856,000	0.05	1,100 m ³ water 492 t raw materials	28	Total:
Water conservation	56,962	43,962	1.3	18,478 m ³ water	-	1,875 t CO ₂
Adjust air fuel mix of Arabic bread burners	0	10,000	0	-	259	2.7 t COD
Heat recovery for the Arabic bread tunnel ovens	69,000	38,000	1.8	-	1,036	2.4 t BOD ₅
Electricity generators with heat recovery and cooling generation	790,000	200,000	4	-	5,200	18,478 m ³ waste water
Good housekeeping measures	41,479	63,599	0.7	7.5 t raw materials	1,479	
Total	€1,002,441	€1,211,561	0.8	19,578 m³ water 500 t raw materials	8,002 MWh	500 t solid waste

Reducing market returns from clients

Return products from Fantasia make 0.6% of production at a cost of 46,360 euros/year, whereas Pain d'Or's product returns mark 7.3 % of the production, costing 1,123,379 euros/year. Using a "production planning, scheduling, optimization and market demand forecasting" software as well as improved information flow between departments, will decrease product returns and save 856,000 euros in raw material, water and energy costs.

Water conservation

Water savings can be achieved by installing a 2nd stage RO for each of the RO systems in the company and this would allow saving around 9,000 m³/year of water. In addition, the Natural Potato Chips production line in FANTASIA uses significant water amounts for washing, grading, peeling, slicing, and blanching corresponding to 55% of total water consumption. By reusing discharged water from blanching at first stage rinsing of potatoes, water consumption could decrease by at least 10%. The company is currently studying the recovery of starch for potential valorization in the future. This intervention is expected to decrease COD and BOD₅ concentrations in waste water by no less than 75% and will not impact the quality of the products.

Upgrade energy efficiency of the Arabic bread tunnel ovens (ABTO)

The ABTO consume around 21.5% of overall diesel use on site. Burner adjustment, better time management, and production coordination could save around 5% of ABTO diesel consumption equivalent to around 24,600 liters/year; subsequently this will also reduce CO₂ emissions by 63 t/year.

More than 80% of the energy input to the Arabic bread tunnel ovens is wasted as heat in the chimney stack. Part of this energy could be recovered to produce hot water and steam, eliminating the diesel used in boilers at Pain D'or, saving annually 99,000 liters of diesel and avoiding CO₂ emissions by 253 t.

For more information, contact:



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Electricity generators with heat recovery and cooling generation

The plant relies on outdated, inefficient diesel generators to cover around 30% of its electricity demand. Replacing them with newer and more efficient ones, connected to a synchronizer board, would save diesel consumption by 177,000 liters/year and 98,000 euros/year at current fuel prices.

The new electricity generators, when operated at least 12 hours in a row, during day shifts, can be integrated with a heat recovery system from exhaust and water jackets that will be used to 1) heat frying oil in Fantasia, 2) generate hot water for miscellaneous applications, 3) produce cooling using absorption chillers technology. This integrated solution will require higher investment costs, though the return on investment will essentially remain the same as for the electricity generators without energy recovery.

Good housekeeping measures

A number of good housekeeping practices have been identified, such as: the insulation of equipment, pipes, walls and ceilings, stopping idle operation of equipment, periodical cleaning of filters and combustion chambers, adjusting the speed of equipment, or minimizing cakes clippings by optimizing cake cutting method. These measures can save around 60,000 euros/year.

"Thanks to MED TEST II project, we can say that there has been a quantum leap in awareness among the staff concerning resources use efficiency. The information system, installed at the start of the project, played a major role in this transformation because it has translated vague concepts and statements into real world numbers."

Marwan El Koussa,
Chairman of the Board of Directors and Owner