



MED TEST Case Study

## FOOD sector — MOROCCO

### Dairy industry — Fromagerie BEL Maroc

#### Company overview

Fromagerie BEL Maroc is a subsidiary of the international group BEL, the world leader for processed cheese. Located in Tangier since 1977, it employs 1,300 people including 40 managers and produces about 39,000 tons/year of processed cheese (more than 40% of which is destined for export), mainly marketed under the following brands: la Vache qui rit, Kiri, Les Enfants.

The company has joined the MED TEST project in order to identify opportunities for an effective use of resources (water and energy), to improve facilities performance, to minimize waste, in particular liquid effluents, and consequently to reduce the investment and operating costs of the designed wastewater treatment plant.

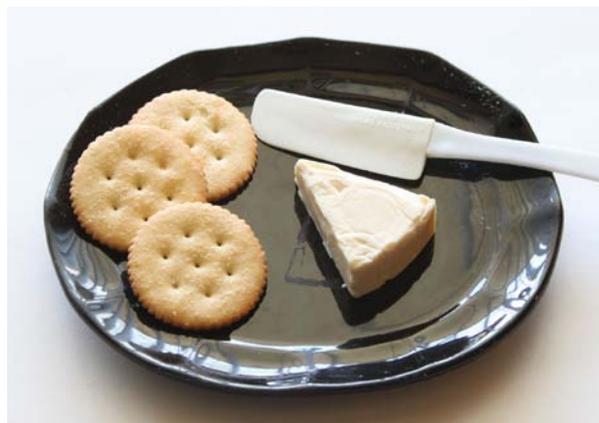
At project start-up, the company was already certified ISO 9001 and ISO 22001. It was certified OHSAS 18001 at the end of 2010 and ISO 14001 in July 2011.

#### Benefits

The actions identified by MED TEST will enable the company to achieve annual savings of about \$US 333,830 in energy (electricity and heat), water and raw material against an estimated investment of \$US 280,328, with a 10-month payback period. Over half of these actions were implemented in 2011 and the rest are scheduled for Q1 2012.

The energy cost savings represent 6.6% (about \$US 134,616) of the actual annual bill (electricity and fuel).

Water costs should be reduced by 20% through optimizing cleaning in place (CIP), recycling white water, repairing water leaks, using adequate equipment for floor and production machines cleaning, and implementing automatic closing of cooling water at vacuum pumps.



**“MED TEST has helped us to implement an adequate system to optimize our energetic and environmental performance.”**

Mrs. Ibtissam NEJJAR, QSE Manager

These actions will also help to achieve environmental benefits including: reduction of wastewater pollution loads by limiting process losses, product recovery during equipment cleaning (transfer tanks, tri-blender, cutter, etc.) and recycling of white water. The reduction of product losses, for instance, will decrease the BOD and COD pollution loads by 2.7% and 3.5%, respectively.

The environmental benefits will also produce economic gains such as a reduction of investment and operating costs of the wastewater treatment plant, the construction of which is scheduled for the first half of 2012.

The company has also benefited from MED TEST technical assistance to establish an environmental management system (EMS) and integrate the identified actions into its environmental policy. These efforts were rewarded with the ISO 14001 certification obtained in July 2011.

MED TEST is a UNIDO green industry initiative to promote sustainability and competitiveness in the private sector in Egypt, Morocco and Tunisia. TEST integrated approach includes tools like resource efficiency and cleaner production, environmental management system and accounting, cleaner technology transfer and CSR.

Learn more about TEST approach at [www.unido.org](http://www.unido.org)

MED TEST is sponsored by the Global Environment Facility, the Italian Government and the MedPartnership.

## Saving opportunities

Measure	Economic key figures			Resource savings per year	
	Savings [USD/yr]	Investment [USD]	PBP [yr]	Water, Chemicals	Energy [MWh]
Boiler and steam system	41 565	56 500	1.28		1 688
Water and chemicals reductions	74 947	135 350	1.80	water 29 930 m <sup>3</sup>	
Electrical system, compressors and lighting	93 051	52 500	0.56		1 094
Product recovery, management of waste and of returns from clients	87 042	2 228	0	product 16 tons	
Energy recovery (chillers)	37 225	33 750	0.90		720
<b>TOTAL</b>	<b>333 830</b>	<b>280 328</b>	<b>0.87</b>		<b>3 502</b>

**Boiler and steam system:** Several measures have been implemented: insulation of hot surfaces with a \$US 24,000 budget, recovery of steam condensate, and the optimal adjustment of burners' combustion. Other options are scheduled, including energy recovery from the boiler's blow-down and installation of an automatic blow-down system. The overall potential saving of fuel amounts to about 11%.

**Water and chemicals reduction:** Several measures have been implemented to reduce water and chemicals consumption, including: NEP optimization (with a frequency decrease from 4 to 2 times a week), recovery and reuse of rinse water, use of spraying nozzles and cleaning guns (more efficient and economic), and automatic closing of cooling water circuits for equipments, like pumps. Vacuum pumps will also be replaced by dry multi-stage pumps.

**Energy recovery from chillers:** Recovering heat from the freezing groups' condensers, the company is using it to defrost the butter stock before use. Recovered heat from other cold rooms will be used to heat sanitary and washing water. The total energy saving is estimated at 720 MWh/year.

**Electrical system, compressors, lighting:** A series of actions have been established to reduce electrical consumption, including power factor increase, optimization of site lighting and installation of a variable speed drive on an air compressor (that had a loading rate of 51%). As for compressed air, the identified actions are primarily related to leaks repair, minimization of compressors' idle operations, installation of automatic solenoid valves on packing machines, and of pressure gauges on the air network. The total savings are estimated at 1,094 MWh/year.

**Product recovery, management of waste and of returns from clients:** As for process equipments (tri-blenders, paste transfer tanks), the identified measures include dry scraping (more efficient to recover the maximum amount of product before cleaning) and recycling of white water in production. The reduction of processing and packing losses will decrease BOD by 6.4 tons/year and COD by 12 tons/year. The company has reduced the amount of returns from clients by analyzing root causes and implementing a set of corrective monitoring and management procedures.



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