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.

Algeria

Tchin-Lait

Food and beverages sector

Context

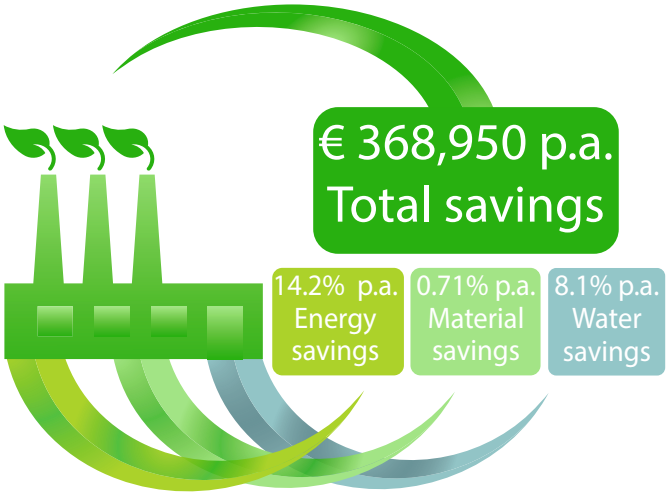
Number of employees:	505
Key products:	UHT Milk; Flavoured UHT Milk; Dairy and Fruit Juice Beverages; Fruit Juice
Main markets:	Local
Management standards:	ISO 9001, ISO 22000

Tchin-Lait is a private company founded in 1999, located on the old Tchin-Tchin lemonade site at the entrance of the city of Bejaia. The company is dedicated to the production and marketing of UHT (Ultra High Temperature) long-life milk and to derivative products such as milk and juice, orange drinks, fruit cocktail, etc. Tchin-Lait has been producing and marketing UHT milk under the Candia label since May 2001.

"Our goals are to increase and diversify our production, while continuously improving the quality of our products, and to better satisfy the needs of our customers. However, this must be done in line with our values of preserving resources and protecting the environment. The TEST approach is an integrated approach that supports our company on the path of sustainable production to which we are committed "

Fawzi Berkati
Director General of Tchin-Lait

Benefits



Graphic: UNIDO

The MED TEST II project identified 23 RECP measures that will annually save 368,950 euros as a result of raw material, water and energy savings. The identified saving measures require an investment of 563,626 euros, which corresponds to an average payback period of 1.5 years.

The return time on investment periods for the identified measures vary between two months and 6.1 years. 35 % of the identified measures were selected to be implemented by the management and 65 % of the measures were retained for further reviews.

Economic gains in resources will be around 0.71 % on the purchase costs of raw material, 14.2 % on energy expenditures, and 8.1 % on the cost of water through implementation of the identified RECP measures.

Environmental gains will result in a 18.6 % reduction of CO_2 emissions, and a 42.8 % decrease in pollution of wastewater. Encouraged by the results of the TEST project, the company plans to integrate the MFCA tool as a complementary analysis tool in the company's accounting system.

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Saving opportunities[1]

Action	Economic key figures			Resource savings & Environmental impacts per year		
	Investment euro	Savings euro / Yr.	PBP Yr.	Water & Materials	Energy MWh	Pollution reduction
Optimization energy consumption	56,611	14,919	3.8	-	5,928	Total : 2,357 t CO_2 261 t DCO 43,976 m^3 waste water
Modification of operational procedures	33,058	128,233	0.3	541.8 t raw materials 5,656 m^3 water	-	
Valorization of white water	65,000	130,266	0.5	606.7 t raw materials 3,587 m^3 water	-	
Sterilizer heat recovery	120,000	29,775	4	1,609 m^3 water	1,056	
Water and chemical products savings	288,957	65,757	4.4	31,805 m^3 water 298 t raw materials	138	
TOTAL	**€ 563,626**	**€ 368,950**	**1.5**	**1,446 t raw materials 42,657 m^3 water**	**7,122 MWh**	

1 Numbers based on production value from 2016

Optimization of energy consumption

The improvement of combustion efficiency in the steam boilers, the thermal insulation of pipes, valves and steam collector, the renovation of degasser with the return of hot condensates to the boiler ,as well as the installation of a heat saver enable the reduction of thermal energy consumption. In addition, installation of an automatic sequencer to control start-up of the air compressors based on the need of production and to avoid their no-load start-up, and the reduction of 6% of the operating pressure of one of the compressors, help to save electrical energy. All of these measures offer an annual energy saving of 5,928 MWh.

Modification of operational procedures

These modifications involve adjusting the frequency of the aseptic intermediate cleaning based on the quality of the milk powders used to reinforce preventive maintenance programs and their performance in a timely manner to reduce unplanned outages for curative maintenance and ensure better recharging of the inverters in order to avoid untimely shutdowns for power failure. In addition, installation of an automated steam demand management device to prevent program fall of sterilizers due to insufficient temperature, can reduce the frequency of CIPs and annual savings of 451.1 m^3 milk; 63 m^3 chemicals and 5,656 m^3 water with a reduction of wastewater pollution flow by 99.2 t of COD annually, or 16.3% of overall pollution.

Re-utilization of white water

White water from shoots during the early and late stages of production contains a significant fraction of milk that can be recovered and reused in various preparations. For this purpose, a system of valves and pipes can be installed to convey the white water to refrigerated recovery tanks. This improvement measure allows the recovery of 606.7 m^3 of milk and 3587 m^3 of water and a reduction in wastewater pollution by 161.7 t of COD annually, or 26.5% of total pollution.

Sterilizer heat recovery

The company uses three tubular sterilization modules with a heat recovery rate of 90%, which is almost the limit for this type of equipment, and a sterilizer with a heat recovery rate of 77%. The improvement measure is to increase the efficiency of the latter to at least 90%, saving 1,056 MWh annually.

Water and chemical products savings

The main measures determined within this scope are:

1. Recycling of NEP used basic solutions after nano-filtration treatment;
2. Reduction of flushing factors on sterilization modules and use of the CIP intelligent option;
3. Reuse of the final flushing water from the CIPs of sterilizers as well as the cooling waters of the filling machines;
4. Replacement of use of water osmosis by water from the drinking water network for cleaning the production plant. These measures save 8.07 % of total annual consumption, reduce the use of chemicals and reduce the volume of wastewater to be treated.

"The TEST approach allows us to improve our environmental and energy performance with positive impacts on our productivity and economic performance. We intend to continue our continuous improvement efforts by implementing environmental and energy management systems in accordance with standards ISO 14001 and 50001."

Mr. Zaoueche
Production Manager

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