



MED TEST Case Study

FOOD sector — EGYPT

Egyptian Company for Starch, Yeast and Detergents

Company overview

Starch, Yeast and Detergents is a medium-size food enterprise owned by the Egyptian Holding Company for Food Industries and producing 10,079 tons/year of fresh and dry yeast for the local market.

The company joined the MED TEST project in order to identify opportunities to increase resource efficiency by solving the existing problems which mainly include: high water consumption, materials and energy losses and in compliance with law limits for discharged effluents.

At project start-up, the company was already certified ISO 9001. It has a short term plan to design an EMS according to the ISO 14001 standard.

Benefits

The MED TEST project has identified annual total savings of \$US 1,726,986 in water, raw materials, fuel and electricity with an estimated investment of \$US 136,474. The simple payback period is less than 2 months. Some of the identified measures have been implemented in 2011; the rest are scheduled for 2012.

Water costs will be reduced by 40% through good house-keeping and water conservation measures, implementation of a monitoring and controlling system for water consumption and improvement of the cooling towers efficiency.

Thermal energy costs will be reduced by 72% by installing a steam trap in the dry yeast plant, reducing steam consumption in CIP and optimizing boiler blowdown. Electricity costs will decrease by 22%, mainly by improving the power factor and installing inverters and soft starters at motors.



“The MED TEST project has supported us in reducing raw materials, water and energy losses through training and technical assistance and in complying with the environmental legislation.”

Chem. Mahmoud EL MIRASY, Chairman

Environmental benefits will be reached thanks to several measures aiming at recovering product and limiting product losses entering the drain system, thus reducing the annual wastewater pollution loads in the existing WWTP, respectively by 12% COD and 16% BOD₅. The company marketing strategy aims at improving product packaging through the installation of a new packaging machine, which in the future will further reduce product losses.

In parallel to the identification of saving opportunities, the site has plans to design an EMS according to the ISO 14001 standard, fully integrating resource efficiency into company policy, action plans and internal procedures. This will ensure the sustainability of all identified actions at company level as well as the development of new projects.

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

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]
Water conservation and CIP of fermentation tanks	483 001	38 974	< 0.1	271 618 m ³ water, 201 tons materials	6 117
Electrical system and efficient motors	154 003	37 500	0.2		3 502
Product recovery	990 289	46 000	< 0.1	930 tons product, 198 tons materials	
Steam system	53 713	13 500	0.3	5 840 m ³ water	3 080
Preventive maintenance	45 980	500	< 0.1	130 790 m ³ water, 40 tons materials	
TOTAL	1 726 986	136 474	< 0.1		12 699

Water conservation and CIP of fermentation tanks: The existing manually operated CIP of the six large fermenters consumes a large amount of water and energy. An effective solution consists of installing rotating spray balls inside the fermentation tanks as well as turbidity/refractive index transmitters to detect product concentration in pipes before starting CIP cycle. Other water conservation measures include the use of high pressure water in washing and the installation of water meters with an effective monitoring plan. The total water consumption will decrease by 27%, energy for CIP by 48%, product losses by 2%, pollution loads by 3% for BOD₅ (20.3 tons/year) and 1% for COD (35.4 tons/year).

Electrical system and efficient motors: Adjusting the power factor will decrease the electricity consumption by 20%, extend the equipment's lifetime and reduce risks for power drops in case of additional load in the future. Installing soft starters at the blowers and inverters at the motors in the fresh and dry yeast formulation units will allow for 2% saving of total electricity consumption. Measuring harmonics will enable to check for distortions in the electrical feeder and to protect the capacitors from damage.

Product recovery: About 9% of yeast losses can be recovered by installing a rubber belt conveyor underneath the filter press,

replacing the existing manual collection and handling of yeast paste, which leads to appreciable product losses; the installation of mechanical seal pumps in molasses and yeast plants will also save 1% of molasses losses. BOD₅ and COD pollution loads will decrease by 10% respectively by 68 tons/year and 354 tons/year.

Steam system: Several measures were introduced to reduce thermal energy and steam consumption: recovery and reuse of steam condensate; optimization of the boiler blowdown system; and installation of a steam trap in the dry yeast plant. These measures would achieve a reduction of thermal energy consumption by 24%.

Preventive maintenance: Establishing regular maintenance programmes, eliminating excessive floor washing and all sources of spillage/water leakages, and avoiding blockage of the wastewater channels are effective measures to increase site performance. The cooling towers efficiency could be increased by periodically adjusting the fan blades angle and the cooling loads, in order to cope with the high cooling demand from the fermentation process and compressors. The implementation of these measures will reduce consumption of water by 13% and of raw and auxiliary materials by 1%, BOD₅ by 3% (20.3 tons/year) and COD by 1% (35.4 tons/year).



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Environmental Management Branch
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Telephone: (+43-1) 26026-0, Fax: (+43-1) 26926-69
E-mail: unido@unido.org, Internet: www.unido.org



EGYPT NATIONAL CLEANER PRODUCTION CENTER
26 A Sherif St., Downtown, Cairo, Egypt
Telephone: 02 23916154
02 23925984
Email: h_elhadary@link.net,
www.enpc.org



EWATEC CONSULTANTS
55 Adham St., # 5 Rassafa Tower,
Moharam Bay, Alexandria, Egypt
Telephone: (+203) 3930700
Fax: (+203) 3906191
E-mail: ewatecteam@gmail.com,
www.ewatec-eg.com

