



MED TEST Case Study

## CHEMICAL sector - MOROCCO

# Chemical industry -ELECTROCHIMIE AFRICAINE

### Company overview:

ELECTROCHIMIE AFRICAINE (ELECAF) is a large industrial company operating in the chemical sector, and located in the industrial area of Moghora in Tangier. It specializes in the manufacture of dry electric batteries, mainly the Superlux brand. The company was founded in 1962 and employs 250 people with a capital of \$US 20 million.

The company joined the MED TEST project in order to identify opportunities for implementing more efficient resource use (water, energy and chemicals), reduce losses and production costs, and minimize discharge, in particular liquid effluent.

In addition, the company has expressed interest in installing a wastewater treatment plant.

### Benefits

The actions identified in the MED TEST project were estimated to allow the company to realize potential annual savings of \$US 223,589 through energy and water and chemical product reductions, as well as through quality improvement and lower non-conformities. Investment to achieve these actions was estimated at \$US 83,650, resulting in a payback period of 4.5 months. More than 35 recommendations for improvement were made to the enterprise. Over half of these actions (69%) were implemented in 2014, the remainder are scheduled for 2015.

To improve performance in terms of quality and the environment, the company implemented several actions to reduce the rate of non-conformity from production and minimize losses. These included in-process battery



voltage control, modification of battery recovery block design, different mould groove material, and monitoring the storage parameters of the cathode mass.

The energy savings achieved were about 16% of the current annual electricity bill.

Potential annual water consumption reduction was 20% through actions such as repair leakage, installation of sub-metering linked to a control system, water reuse at the osmosis station, and minimization of floor and production unit cleaning.

In addition to identifying opportunities for savings, the company updated internal procedures and the action plan to integrate cleaner production and resource efficiency into its management system to ensure the sustainability of all actions identified in the company and the development of new resource optimization projects.

This would contribute to conserving the scarce water resources in the region.

### About MED TEST

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

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

## Savings options:

Option	Economic key figures			Resource savings per year	
	Savings [USD/yr]	Investment [USD]	PBP [yr]	Water [m <sup>3</sup> /yr] chemical products	Energy Mwh/yr
Electrical system and compressors	25 748	22 353	0.8		222.3
Process improvement and quality	122 588	15 412	0.1	9 111 kg	
Water management and effluent	42 282	37 882	0.9	Water 1 642 m <sup>3</sup>	
Chemical management			6	8 100 m <sup>3</sup>	
Waste management	28 471	7 059	0.3	Chemicals 6 620 kg	
<b>TOTAL</b>	<b>4 500</b>	<b>941</b>	<b>0.2</b>	<b>Water 1642 m<sup>3</sup></b> <b>Chemicals 5.5 t</b> <b>Waste 32.2 t</b>	<b>222.3</b>

### Electrical system and compressors:

The project identified several measures for reducing power consumption including: optimization of the electricity contract after power factor improvement, installation of electrical meters linked to an energy management system, and optimization of lighting. For compressed air, a preventive maintenance and air leak repair program, air leak repair were set up, traps installed on the supply tank outlets, and pressure gauges and isolation valves installed on the compressed air network. These measures reduced annual electricity consumption by 222 MWh.

### Process improvement and quality:

The project identified a number of process and machinery measures to improve product quality and reduce the rate of non-compliance. These included: introducing regular voltage controls along the assembly line (online tester), periodic calibration, and a qualified supervisor to control operations. The design and material of the battery recovery blocks were changed to increase their lifespan. The assembly of filling and capping machines was changed to prevent degradation of components due to handling and humidity. To increase machine reliability and productivity, grove mould material made in stellite was replaced by ceramics more resistant to the cathodic mass.

### Water management and effluent:

The project identified a number of measures to reduce water consumption including: installation of meters and monitoring of daily consumption, recovery of releases from the reverse osmosis station then used to cool the vacuum pumps or for cleaning, redesign of the sewer system to separate the process chemical effluents and other wastes, replacing water cleaning with dry vacuum cleaning wherever possible. These measures reduced water consumption by approximately 1,640 m<sup>3</sup>.

### Chemical management:

The good practice measures identified to optimize chemical consumption and loss: storage of cathodic mass used in controlled storage room with temperature and humidity control, reducing chemical losses by establishing handling, weighing and storage procedures, and training and awareness of operators for environmental aspects. Other actions included the regular maintenance of the dust collection system to make it effective, and the design of a new working post bitumen preparation according to the standards of safety and the environment.

### Management and recovery of waste:

Waste such as cardboard, plastic, scrap metal are separated, baled and sold to specialized contractors in recycling. The residues of non-usable chemicals are collected and stored by company, and then suppliers are contacted to recover these products.



**UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION**  
Environmental Management Branch  
Vienna International Center, P.O Box 300, 1400 Vienna, Austria  
Telephone: (+43-1) 26026-0, Fax: (+43-1) 26926-69  
Email: [unido@unido.org](mailto:unido@unido.org), [www.unido.org](http://www.unido.org)



Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem

**MedPartnership**