

*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.*

## Morocco

### Naturex Chemical sector

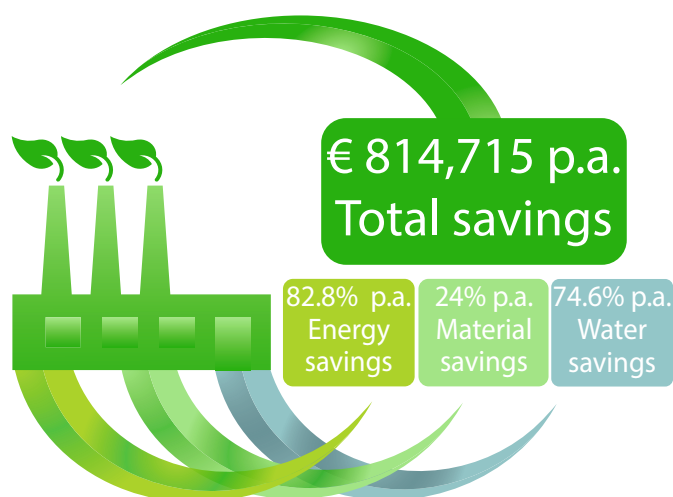
#### Context

Number of employees:	94 Permanent 32 Seasonal
Key products:	Aromatic products and essential oils
Main markets:	International

NATUREX Morocco, created in 1992, specializes in the production and marketing of natural ingredients for the agri-food, nutraceutical and cosmetic industries. The site also includes quality control laboratories and its administrative management service.

NATUREX is committed to supplying ingredients exclusively from certified factories according to the latest quality standards. In order to ensure quality production and to comply with customer demands and the legislation, NATUREX Morocco has developed and implemented a food safety management system based on the principles of the international ISO 22000 standard and HACCP.

#### Benefits



Graphic: UNIDO

The MED TEST II project has identified opportunities for total annual savings of € 814,715 in raw materials, water and energy for a projected investment of € 1,491,361. The average return on investment period for the identified RECP measures is 1.8 years.

Of the recommended measures, 68% were accepted by the management and are in the process of being implemented, the others 32% requiring further study. No measures were rejected.

Through the improvement and optimization of production and the installation of more efficient equipment, these measures implemented will reduce energy consumption by 82.8%, water consumption by 74.6% and solvents (operating materials) by 24.0%. The environmental benefits achieved through several water and energy treatment and recovery measures will reduce annual charges and reduce CO<sub>2</sub> emissions by 70.4% (5,496 t).

## Saving opportunities<sup>1</sup>

Action	Economic key figures			Resource savings & Environmental impacts per year		
	Investment euro	Savings euro / Yr.	PBP Yr.	Water & Materials	Energy MWh	Pollution reduction
Utility energy efficiency and PV electrical generation	303,634	65,768	4.6	-	839	Total: 5,496 t CO <sub>2</sub>
Improved thermal performance and energy recovery	144,627	148,176	1.0	1,653 m <sup>3</sup> water	4,751	
Recasting industrial water circuits to save solvents	263,831	287,840	0.9	1,095 m <sup>3</sup> water 247,000 litres of solvents	423	
Establishment of a complete system of energy and water management through ISO 50001	37,464	50,822	0.7	2,622 m <sup>3</sup> water	1,267	48,461 m <sup>3</sup> waste water
Biomass boiler, sludge recovery and wastewater recycling	741,805	262,109	2.8	43,092 m <sup>3</sup> water	9,440	
<b>TOTAL</b>	<b>€ 1,491,361</b>	<b>€ 814,715</b>	<b>1.8</b>	<b>247,000 litres of solvent 48,461 m<sup>3</sup> water</b>	<b>16,721 MWh</b>	

<sup>1</sup> Numbers based on production value from 2015

### Thermal energy and water saving

Thermal energy costs will be reduced by the thermal insulation of all hot and cold surfaces of the production circuit, the use of osmosis water as make-up water, the improvement of the combustion efficiency by using the automatic regulation mode, the reuse of the condensates and the reduction of the thermal losses of the boilers.

The installation of a combustion air preheating system by recovery of thermal energy around chimney walls will generate additional savings

### Recasting industrial water circuits to save solvents

An extensive redesign of the industrial cooling water circuit (air cooler + brine) to reactor and exchanger solvents will facilitate flow balancing for each requirement and will result in significant power savings. The installation of a bypass water filter will keep the water free of SS so as to facilitate the maintenance of exchange efficiencies of each equipment and consequently a reduction of solvent consumptions and a reduction of water loss.

### Establishment of a complete energy and water management system through ISO 50001

Implementation of an electrical energy, thermal and water management system, in order to implement the ISO 50001 standard on energy management, the implementation will enable substantial gains through continuous monitoring of consumption over time and in relation to production and better use of resources.

### Biomass boiler, sludge recovery and wastewater recycling

The installation of a biomass boiler will completely cover the thermal needs for steam and will generate a major tariff economy. The recycling of water from the WWTP and the recovery of sludge will have a positive impact on the environmental report of the company.

## For more information, contact:



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