

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.

# Egypt

## BariQ Egypt

### Chemical sector

#### Context

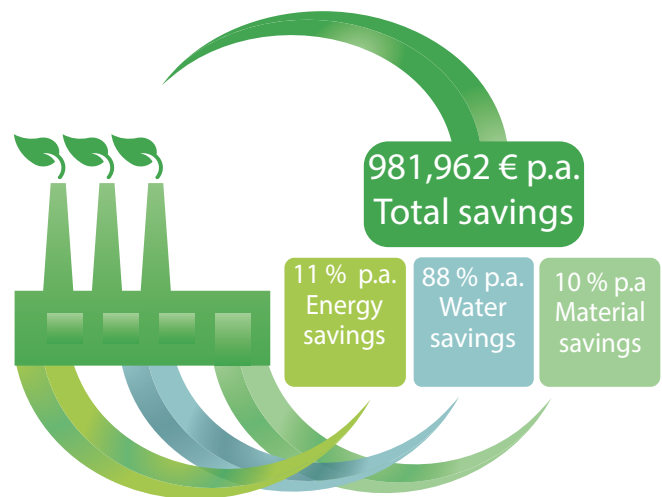
Number of employees:	153
Key products:	RPET, RPP & RPE Pellets with brand names QPET, QPE & QPP
Main markets:	94% Export; USA & Canada, EEA, Turkey and KSA
Management standards:	Quality (ISO9001); EHS (ISO14001 OHSAS18001); and food safety (ISO22000)

BariQ Egypt, a subsidiary of Raya Holding, is the biggest bottle-to-bottle recycler in the MENA region. It was established in 2010 and has been in operation since 2012. The company reprocesses postconsumer plastic PET bottles into food grade FDA, EFSA, REACH & Health Canada compliant PET pellets on the foundation of two sustainability pillars of being economically justified and environmentally sound. BariQ incorporates state-of-the-art cutting-edge green technology from major European suppliers with a total annual capacity of 15,000 MT, targeting major international bottle and food container makers and major fiber producers throughout Europe and North America.

*“BariQ in the last period faced a few challenges related to the quality of feedstock, and excessive consumption of resources such as water. These, in turn, are reflected in higher conversion costs, so overcoming such challenges would definitely lead to a better and more efficient performance in both operations and financial aspects”*

Mohamed Gamal, COO  
BariQ Egypt

#### Benefits



Graphic: UNIDO

The MED TEST II project identified measures bringing total annual saving of 981,962 euros in energy, water and raw materials with an estimated investment of 358,000 euros. Eleven saving measures have been identified to reduce the consumption of energy (electricity and fuel), water and raw materials and eight of them were accepted by the top management for implementation.

The average payback period is 0.4 years, and 36% of the measures have already been implemented.

Materials consumption will be reduced by 10%, energy consumption by approximately 11% and water by 88%. Additionally, CO<sub>2</sub> emissions will be reduced by 9%.

The company completed the upgrading of their ISO 14001 certification to the 2015 version during the project implementation period. The company also was advised to change its accounting system to achieve better tracking of materials and losses.

Following the MED TEST II project implementation, the company's TEST team continued to use the methodology independently. Applying the knowledge gained during the TEST training, the BariQ engineers successfully identified two energy measures that would deliver significant results, improve product quality and further increase on the project gains. Following the root cause analysis, two existing grinders were identified as source of increased energy consumption. The proposed equipment replacement will also necessitate an upgrade in the flakes sorter, to manage the increased production capacity. Both projects are potentially eligible for the EBRD financing facility in Egypt (GEFF).

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

Action	Economic key figures			Resource savings & environmental impacts per year		
	Investment euros	Savings euros / yr.	PBP years	Water and raw materials	Energy Mwh	Pollution reduction
Better quality of secondary raw material	none	310,275	Immediate	15,000 m <sup>3</sup> 340 t of raw materials	-	Total 548.3 t of CO <sub>2</sub>  1,180 t of waste
Optimisation of PET washing line bottle pre-treatment	185,000	444,338	0.4	640 t of raw materials	-	
Optimisation of PET washing line flakes production	173,000	206,350	0,8	42,000 m <sup>3</sup> 200 t of raw materials	930	
Adjusting the set points of the Solid State Polycondensation (SSP) production line	none	21,000	Immediate	-	600	
<b>Total</b>	<b>358,000 €</b>	<b>981,962 €</b>	<b>0.4</b>	<b>57,000 m<sup>3</sup> of water 1,180 t of raw materials</b>	<b>1,530 Mwh</b>	

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

### Better quality of secondary raw material

This measure entails the increase of the production capacity by importing PET bottles from European countries. The European raw materials have indeed less oily bottles (below 10% compared to the local 50%), less contamination levels such as PVC and the process yield from the imported bottles is therefore higher, generating around 340 tonnes/year of additional end product (compared to the equivalent input from local supplies) and bringing a corresponding reduction in waste generation. Moreover, this will reduce excessive water and detergent consumption needed for removing the oil from the raw material.

### Optimisation of PET washing line bottle pre-treatment

This action includes four measures; adding two new machines for label separation and sand and dirt removal ahead of the washing line, reprogram the existing automatic bottle sorting machines in order to increase their efficiency, installing a third smaller automatic bottle sorting machine, and contacting the local PET suppliers to eliminate the carton sheets from the bottle bales. Those actions will result in a decrease in the ratio of suitable bottles that were rejected, thus increasing the yield of the raw material.

### Optimisation of - PET washing line flakes production

The action consists of different measures which will lead to reduction in energy and water consumption, as well as reduction in the rejected products. Firstly, restart the vacuum filter which is an equipment designed to reducing the content of the labels' glue and fines found in the washing line water, resulting in a reduction in water consumption and better quality of the final product (PET flakes). Secondly, conduct some adjustments and fine tuning to the PET flakes automatic sorting machine, yielding a reduction in material losses, and finally, an investment project to separate the oil from the washing water, thus reducing the water and fuel consumption.

### Adjusting the set points of the Solid State Polycondensation (SSP) production line

Temperatures at different drying, crystallisation and pre-heating stages of the Solid State Polycondensation (SSP) production line were noted to be higher than the recommended settings. Resetting those temperatures to the optimal process parameters decreases energy consumption, as well as improves the quality of end products.

*“The MED TEST II project assisted in identifying and exploring the hidden potential for resource efficiency while benchmarking with industry-related global best practices, and leveraging our team’s knowledge and capabilities through the provision of different tools, trainings, workshops and knowledge exchange with experts in the field”*

Mohamed Gamal, COO  
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