

# RECP Best Practices Catalogue

## *Installation of an absorption refrigeration unit*

*Developed within the framework of MED TEST II*



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION



The SwitchMed Programme is  
funded by the European Union

# Best Practice - Installation of an absorption refrigeration unit

<b>SECTOR:</b>	<b>Chemical and Pharmaceutical</b>
<b>SUBSECTOR:</b>	Manufacture of soap and detergents
<b>PRODUCTS</b>	Sulphonic acid, SLES (sodium laureth sulphate), Sodium silicate
<b>CATEGORY</b>	Technology upgrade/Eco-innovation
<b>APPLICABILITY</b>	Utilities

<b>COMPANY SIZE</b>	40
---------------------	----



The SwitchMed Programme is funded by the European Union

# Best Practice - Installation of an absorption refrigeration unit

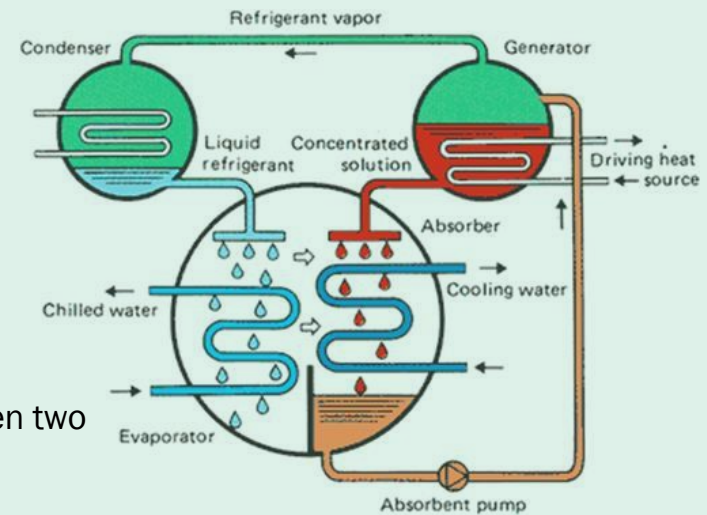
## Description of the Problem (Base Scenario):

The process at the company is exothermic. In fact, combustion of sulphur produces a great amount of heat to facilitate the conversion of  $\text{SO}_2$  into  $\text{SO}_3$ . This heat is currently used to produce steam for melting sulphur and the excess is either cooled in the process itself or released into the atmosphere. The cold system is used to control the temperature of the exothermic conversion reaction from  $\text{SO}_2$  to  $\text{SO}_3$ .

## Description of the Solution

The improvement consists in recovering the heat by using it as a "driving heat source" in the diagram shown.

It is a matter of recovering some of this heat to produce the cooling capacity required to replace the current cooling unit. There are several sources of heat. Part of the steam directly emanating from the sulphur boiler can be used. A heat exchanger can also be installed at the point of the converters (between two stages of catalysts) to produce overheated steam or water.



# Best Practice - Installation of an absorption refrigeration unit

<b>Economic Gain</b>	The gains generated by this measure are calculated at € 30,455/year. We believe that the electric unit will only work when the production line starts, the time to needed let the exothermic production of heat start the production of cold by absorption.
<b>Environmental Gain</b>	On the environmental side, the impact is linked to the ratio of CO <sub>2</sub> emissions per KWh produced at the national level (735 kg of CO <sub>2</sub> /MWh), or for a reduction in consumption of 350,000 KWh/year. This is a reduction of GHG emissions of 257 tons of CO <sub>2</sub> /year
<b>Health and Safety Impact</b>	The use of the ammonia/water absorption system can have a potential negative impact on health safety in case of ammonia leakage.



The SwitchMed Programme is funded by the European Union

# Best Practice - Installation of an absorption refrigeration unit

<b>Investment and Financial Indicators</b>	The investment is to be specified, but it should be between € 72,727 and € 90,909 (Or a Time for Return on Investment of 3 years)
<b>Suppliers</b>	Contact representatives of absorption chiller manufacturers to obtain the required negative temperatures to the brine, ammonia/water absorption system must be used.
<b>Other aspects</b>	No negative impact on product quality
<b>Implementation and New Indicator</b>	Scheduled for 2018



The SwitchMed Programme is funded by the European Union