

SUSTAINABLE ENERGY FINANCE IN LEBANON

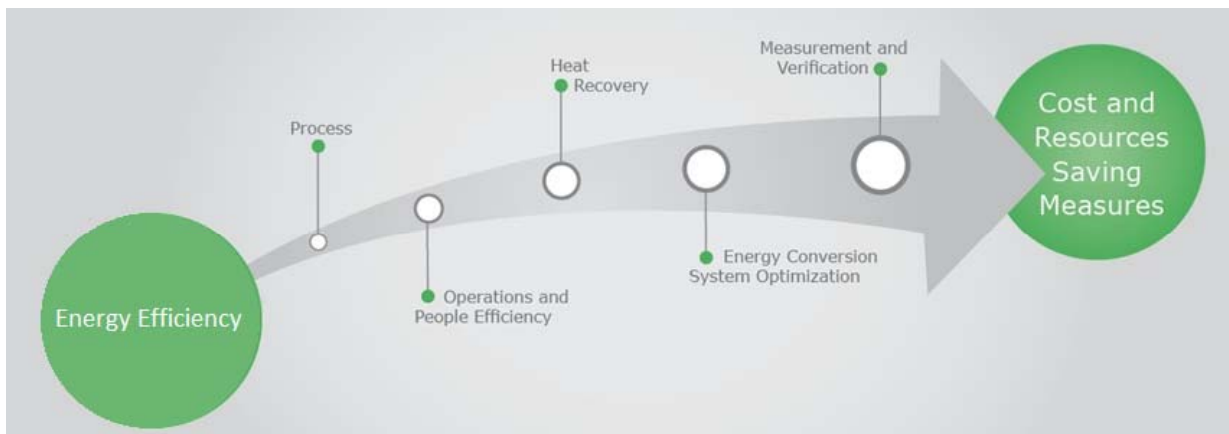
ENERGY EFFICIENCY IN THE INDUSTRIAL SECTOR



September 19, 2017

INTRODUCTION

Fransabank has put the Energy Efficiency for the Industrial Sector at the forefront of its strategic Sustainable Energy Finance action :



ENERGY EFFICIENCY IN LEBANON INDUSTRIAL SECTOR EXAMPLES

Process

- Machine Replacement or capacity increase : considering all energy aspects
- Benchmarking to Best Available Technologies (BAT) to understand the process Minimum Energy Requirements (MER)
- Better demand control (e.g VFDs for motors)

Operations and Behavior

- Making Energy Efficiency a strategic management decision
- Assigning Energy Champions
- Increasing awareness to inefficient behavior (e.g. using compressed air for cleaning, steam traps systematic maintenance)

Heat Recovery

- Combine Hot and Cold streams to optimize heat recovery
 - Use waste heat from:
 - Generators Exhausts
 - Ovens
 - Boilers
 - Refrigeration
 - Air comp.
- To cover/partially hot water/ steam needs

Energy Conversion Systems

- Optimize existing systems, e.g.:
- Installing economizers to improve system efficiency on boilers
- Condensate and Flash steam recovery on steam boilers
- Improve Compressed air control and segregate usage

ENERGY EFFICIENCY IN LEBANON INDUSTRIAL SECTOR EXAMPLES

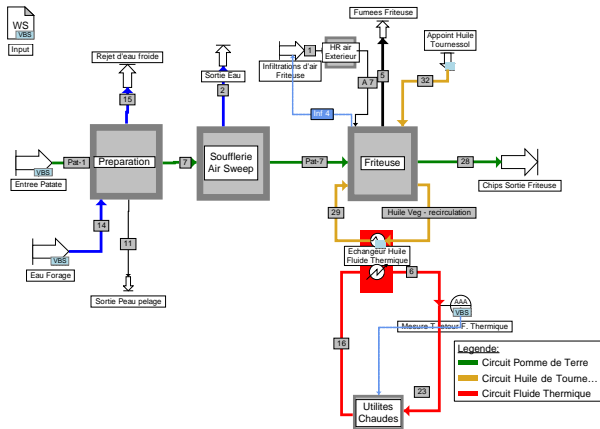


Project:
Optimized Intra Process Heat Recovery in a Dairy Manufacturing Plant pasteurization / concentration Process

Results:

- Up to 23% energy savings
- Simple Payback of less than 2 years

ENERGY EFFICIENCY IN LEBANON INDUSTRIAL SECTOR EXAMPLES



Project:
Process Modification to reduce surface water on potatoes
Generators Heat Recovery to preheat cooking oil in a Potatoes Chips Factory

- Results:**
- Up to 36% energy savings
 - Simple Payback of less than 3 years

FRANSABANK– Sustainable Energy Finance in Lebanon - Page 5

ENERGY EFFICIENCY IN LEBANON INDUSTRIAL SECTOR CASE STUDY



Industry : Food and Beverages (Bakeries)

EE and RE Technologies:

Solar Photovoltaic, LED Lighting, Oven Combustion Air Pre- Heating from Waste Heat

Project Cost : 560,000 USD

Energy savings	Yearly cost savings	Yearly GHG Emissions savings	Payback Period
360 MWh	USD 54,000 (using actual diesel cost)	234 ton_CO2_eq	5 years – estim. (at the time of project implementation)

FRANSABANK– Sustainable Energy Finance in Lebanon - Page 6

ENERGY EFFICIENCY IN LEBANON INDUSTRIAL SECTOR CASE STUDY



Industry : **Steel Industry**

EE and RE Technology : **Compressed Air, Cooling Optimization, Variable Frequency Drives on cranes and motors, Photovoltaic, Increasing Daylight, O&M**

Project Cost : **980,000 USD**

Energy savings	Yearly cost savings	Yearly GHG Emissions savings	Payback Period
934 MWh	USD 149,000	607 ton_CO2_eq	6.5 years (at the time of project imp.)

FRANSABANK– Sustainable Energy Finance in Lebanon - Page 7

WHERE TO START

Actions

- Take a moment to understand your current process energy requirements
- Start Monitoring, Tracking and reporting your kWh e and kWh th per unitary product per process line
- Look at waste heat opportunities
- Reduce your peak demand (e.g. Process control / VFDs)
- Look at inter factory utility integration opportunities

Objectives

- Set your Energy Saving Targets
- Benefit from the current financial incentives
- Increase your profitability: Each kWh per Unitary product saved has direct impact on your bottom line and profits

ENERGY WASTE is equivalent to **PRODCUT WASTE**
ENERGY SAVING is equivalent to **PRODUCTION INCREASE**

FRANSABANK– Sustainable Energy Finance in Lebanon - Page 8

SPECIAL THANK YOU ...

To Fransabank for promoting the Energy Efficiency in the Industrial Sector and leveraging IFC lesson learning opportunities



To the Association of Lebanese Industrialists for supporting this initiative



To the Italian Ministry of Environment, Land and Sea for their support and assistance

