Energy Management in the Lebanese Industrial Sector

SwitchMed/MED TEST II PROJECT
AN INTEGRATED APPROACH TO RESOURCES EFFICIENCY

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SUMMARY

- MED TEST II Project
- TEST Methodology
- MED TEST II in Lebanon
MED TEST II Project

- Component of the EU funded SwitchMed Program on Sustainable Consumption and Production in the southern Mediterranean region implemented by UNIDO

- Project aims at greening the industrial sector in a sustainable manner through

1. Implementation of integrated environmental services (UNIDO TEST Methodology) in industrial companies based on pollution prevention with focus on resources efficiency and cleaner production (RECP) supported by Environmental Management Systems (EMS) and Environmental Management Accounting (EMA)
2. Capacity building for service providers offering RECP services to meet the industry needs

3. Recommendations to policy makers to support introduction of RECP in industry

- Business approach with the environment in mind (EMS/EMA)
Industrial Research Institute (IRI) is the implementing partner of UNIDO in Lebanon (MED TEST II)

Counterparts: Ministry of Industry, Ministry of Environment

Key stakeholders: Association of Lebanese Industrialists, Banque du Liban, Chamber of Commerce, Industry and Agriculture of Beirut & Mount Lebanon

Duration: January 2015-April 2017
MEDTEST II Builds on the UNIDO MED TEST I pilot phase (2009-2012)

Countries: Egypt, Morocco, Tunisia

Target: Industrial hot spots on the Med Sea

Funding: GEF, Italian Government, Private sector
UNIDO MED TEST I - Results

Key Figures from Industry demonstrations
(43 industries, 7 industrial sectors)

- 9.7 M m³ water identified savings/yr
- 263 GWH energy identified savings/yr
- 17 M USD identified cost savings/year

Industry Fact sheets: www.unido.org/MEDTEST
TEST METHODOLOGY
TEST Methodology

Input Output analysis: mass balance & monetary flows

PLANT XYZ OPERATIONS, A BLACK BOX

STOCKS

Energy
Water
Raw Materials
Operational Materials
Packaging

Non Product Outputs (NPOs)
Priority Flows

Energy
Wastewater
Solid Waste
Toxic Waste

PRODUCTS
CO-PRODUCTS

Baseline

Benchmarks
TEST Methodology

Production centers

Energy inefficiency centers (Hot spots)

Benchmarks

Baseline

Energy

STOCKS

Monitor Energy paths in XYZ plant

PRODUCTS

CO-PRODUCTS

What is Next??
TEST Methodology

Next TEST steps

Root cause analysis → Options generation →

Feasibility analysis → Action plan →

Information system → Implementation →

Monitoring/evaluation → Act and sustain → Follow up

What about the integrated approach??
TEST Methodology

INTEGRATED APPROACH

- A TEST Team is usually made up of
  - Cleaner production expert(s)
  - Process expert(s)
  - Energy expert(s)
  - Environmental Accounting Expert(s)

- All factors of production are addressed with the aim to maximize resources efficiency (with mirror team)

- The process expert may sometimes contribute to Energy Efficiency improvements as much as or may be even more than the Energy expert!!
TEST Methodology

INTEGRATED APPROACH

Boiler

100 kwhr of fuel

\[ \eta = 80\% \]

80 kwhr of steam

1 kwhr/unit

100 kwhr 80 units

Initial status

Process

89 kwhr of fuel

\[ \eta = 90\% \]

80 kwhr of steam

1 kwhr/unit

89 kwhr 80 units

Intervention Energy expert

62 kwhr of fuel

\[ \eta = 90\% \]

56 kwhr of steam

0.7 kwhr/unit

62 kwhr 80 units

Intervention RECP team
TEST Methodology

INTEGRATED APPROACH

GOLDEN RULE

NEVER, EVER, DO INTERVENTIONS ON THE SUPPLY SIDE BEFORE ADDRESSING THE DEMAND SIDE

The cleanest and cheapest type of energy is .................
MED TEST II IN LEBANON
9 companies in the food sector are involved (Dairy, bakery, canned food, beverage, confectionary, chips). Technical assistance provided by IRI and 8 industrial service providers.

- Average yearly energy expenditure per firm: 1 million USD
- Average share of energy in material input cost: ~ 7.5%
- Average share of energy in NPO: ~ 50% (*taking into account externalities in accounting for water cost*)
A preliminary energy information system is implemented in 8 companies (Company 9, work in progress)

More than 170 electricity meters are installed and an equivalent number of run hour meters

19 Energy meters, 11 diesel meters and 25 fuel tanks gages are installed

YOU CANNOT MANAGE WHAT YOU DO NOT MEASURE
At every sunrise (except holidays), around 400 energy-related monitoring points are read and recorded in all 8 plants. (A continuous process)

The daily production output of ~ 90 products is recorded.

Total cost of preliminary energy information system in all 9 plants exceeds USD 50,000 (invested by companies).
The immediate outcome of the monitoring process is to determine energy use “hot spots” in the plants.

The longer term outcome is to put in place a management information system in each of the 9 companies (EMS/EMA). (Potentially ISO 14001, ISO 50001)

By April 2017, energy efficiency initiatives should have been already implemented in all 9 companies.
The aim of the IRI MED TEST II team is to make out of the 9 companies involved in the project the champions of environmental performance in the Lebanese industrial sector.

Thank you
Enjoy your lunch.... after the Q&A