RECP Best Practice Catalogue

Lowering electricity consumption within refrigerators and freezers through better Summer / Winter settings

Developed within the framework of MED TEST II

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switchmed

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SECTOR:	**Food & Beverage**
SUBSECTOR:	Processing and preserving of meat and production of meat products
PRODUCTS	Cold Cuts – Mortadella (Siniora, Al-Nemeh, Al-Taj), Roast, Luncheon (Siniora, Al-Nemeh, Al-Diften)
CATEGORY	Process Control or modification
APPLICABILITY	Utilities

COMPANY SIZE	200

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Description of the problem (Base scenario):

Monitoring performance of refrigerators and freezers showed that the condensing temperature is between 25-30 °C in the period from November to April. The company is located at a relatively high altitude in a climate zone corresponding to Ramallah providing relatively low ambient temperatures. However, air flow to the condenser is not regular due to problems in operation of fans.
As second cause of losses was identified too high defrost temperature as setted up both for Summer and Winter in comparison with the best practice as shown in the tables below:

Defrost old setting values

Season of the year	Set temperature of defrost	Time for defrost
Summer	20 °C	30 min – 1 h
Winter	22 °C	45 min - 1 h

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Description of the solution

The company achieved an electricity saving of 2-5% per Degree Celsius through adjusting condensing temperature and operating fans more frequently in order to keep the condensing temperature between 37-40° C.
The second identified measure was better regulation of the defrosting temperature by changing the temperature and defrost time as shown in the table below.
Implementation of these measures leads to saving of 16-20 % of energy consumed by refrigerators and freezers.

Defrost new setting vale

Season of the year	Set temperature of defrost	Time for defrost
Summer	16 °C	45 min - 1 h
Winter	20 °C	30 - 45 min

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Economic Benefits	Benefits after adjusting the settings for the refrigerators and freezers: • Operational Savings: 16-20% of energy consumed (appr. 245 MWh/year) **TOTAL Saving : 33,600 Euro/year**

Environmental Benefits	Reduced electricity consumption by appr. 245 MWh/y (16-20% chillers consumption) and CO2 emission by 183 ton/an
Health and safety impact	**N.A**

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Capital investments & financial indicators	Zero investment Immedeate payback
Suppliers	N.A
Other aspects	Problems faced: • Weather fluctuations • Lack of digital monitoring system - the company is using separate meters for monitoring electricity consumption by each unit

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Implementation	A number of low or no cost energy conservation measures which were already implemented by the company and their benefits were verified by installed sub-meters which become part of information system for monitoring of resource efficiency. This information sytem also showed that measures described in this best practice will save more than originaly calculated € 33,600.

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