RECP Best Practice Catalogue

Upgrading the cold stores cooling units

Developed within the framework of MED TEST II

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

switchmed

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Best Practice - Upgrading the cold stores cooling units

SECTOR:	**Food & Beverage**
SUBSECTOR:	Manufacture of other food products
PRODUCTS	Yeast
CATEGORY	Technology upgrade/Eco-innovation
APPLICABILITY	Utilities

COMPANY NAME	----
COMPANY SIZE	Medium

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Description of the problem (Base scenario):	After conducting site measurements for the existing cold stores' cooling units, it was found that most of the cooling units have low performance due to the lack of maintenance. After conducting air flow and temperature measurements for the outdoor cooling units in addition to the input power measurements, the actual COPs of the cooling units were calculated. Some problems were noted on these cooling units that affect the COP value. One of the main noted problem is that the condensers' fans did not run resulting to a very weak heat exchange between the outside air and the hot refrigerant gas. This affects the performance of the cooling units. Another noted reason for low COP values is the existence of the short air cycle between the air discharge and suction in the outdoor unit, in which the hot discharged air returns to the unit's suction. This leads to reduction of the amount of heat that can be transferred to the outside air. Also the lack of insulation on the refrigerant coils and the unshaded outdoor units are negatively affecting the unit performance by adding extra loads due to the bad isolation from surrounding.
Description of the solution	Upgrading these units (well-insulating the refrigerant coils, fixing condenser fans, cleaning condenser air filter, ventilating the suction and discharge air in the outdoor units, etc,..) will rise their performance and reduce the operating hours as well as the energy consumption. - Cold store#1: Cooling unit No. 9 (Condenser fan replacing and relocating the compressor). - Cold store#2 : Cooling units No. 3, 4 and 5 (Coils insulation, units shading and relocating the compressor) - Cold store #3 : Cooling unit (Coils insulation, compressor relocating)

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Economic Benefits	Average COP old: 1.1 Average COP new: 1.3 Saving %: (COPnew - COPold) / COPnew % Saving: 15.48% Saving: 15.48%* 820,044 kWh/yr (annual cooling units consumption) Energy Saving : 127,000 kWh/year Annual Saving: € 15,200/year
Environmental Benefits	Energy Saving = 127,000 kWh/year (15.5% of the electrical energy) Reduced CO_2 emission = 71.0 ton/year
Health and safety impact	----

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Capital investments & financial indicators	Investment= €2,700 Payback period= 0.2 years
Suppliers	Local Company
Other aspects	---
Implementation	Implemented.