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FACTSHEET

ICCEE
Improving Cold Chain Energy Efficiency in food and beverage sector

Optimisation of the cooling distribution system

'Don't lose the cold you produced.'

A well-balanced circuit can save up to 35% of energy consumption.

Belgium
Pasta production

TRL 9

The conception and maintenance of the cooling distribution system is key to achieve optimal efficiency of the overall industrial cooling process. The efficiency of a cooling distribution system depends on two main factors:

- The isolation of the cooling fluid distribution pipes to prevent heat losses and equipement degradation;
- The optimization of the distribution pumps' controlling system to reduce pressure losses and cavitation.

In some distribution cooling systems, it can be observed that pumps work with at higher flow and pressure head than necessary. If the system is not properly pressurized, the risk of pump cavitation is high. Using differential pressure control solutions can help optimize the performance of variable speed pumps and avoid overconsumption.

Main NEBs (other benefits)

Reduced heat losses and pressure drops
Maintenance of the equipments
Prevent degradation of the pipes
Prevent overconsumption of the pumps

Description

A SME company from Belgium employs about thirty people and produces pasta and pasta products (lasagna, eggplant rolls, etc.). The company produces about 2500 tons of pasta per year. The cold occupies an important part of the energy consumption of the company. It is used both to cool production areas and some equipment, but also to store finished products (fridges and freezers).

The company invested in a new cold production unit in order to meet its growing needs and, in the context of legislation aiming at gradually eliminating the use of HCFC R22, harmful to the ozone layer, as a gas refrigerant (still used within the company in old refrigeration plants).

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This project was an opportunity to implement an energy optimized solution.
The chosen cold production unit works with ammonia as the refrigerant gas and uses an intermediate fluid (glycol water) to distribute the cold to the different consumers of the company (cold rooms, machines, production and storage areas).

Optimisation of the cooling distribution system

The cold distribution throughout the company is carried out by a glycoled water circuit.
In order to adapt the control of the distribution pumps to the flow rate required by the circuit (consumers), the pumps are fitted with frequency converters.
Particular care has been taken in insulating the glycoled water circuit pipes, in order to reduce heat losses but also to avoid condensation and corrosion that are commonly observed in this type of distribution systems.

Opportunities and barriers to implementation

Opportunities	*Barriers*
Reduced heat losses	Additional cost for maintenance of the equipment
Reduced pressure losses and cavitation	
Lower electric consumption and related cost	
Prevent degradation of the pipes	
Prevent overconsumption of the pumps	

References

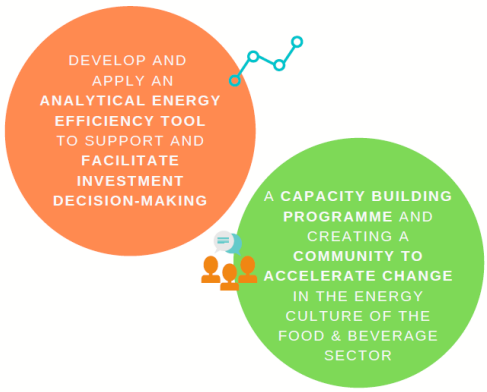
[1] https://energie.wallonie.be/fr/optimisation-energetique-d-une-nouvelle-installation-de-production-de-froid-chez-pastificio-della-mamma.html?IDC=8041&IDD=97754

About ICCEE

The project ICCEE, **www.iccee.eu**, funded by the EU programme Horizon 2020, aims at improving energy efficiency in the cold chain of the food & beverage sector and making it easier for the sector to:

- undertake energy efficiency measures across the entire supply chain and
- accelerate the implementation of energy audit results.

ICCEE follows a holistic approach that moves from a single company perspective to the assessment of the entire cold supply chain. Existing financing schemes for SMEs will be assessed: the optimal ones will support the implementation of energy efficiency measures. ICCEE objectives build on 2 pillars:



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