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Neutral planning allows savings

Cooling in meat processing plants is always a cost driver. High overheads and running costs put companies under more and more pressure every year. The problem has been exacerbated since new F-gas-regulations calling for a Europe wide phase down for cooling agents, were introduced in March 2014.

Politically driven plans to reduce fluorinated greenhouse emissions, or phase down CO₂ equivalents, mean that the amount of cooling agent to be imported into Europe is limited. Cooling agents which are harmful to the environment will be very expensive and difficult to come by. We are looking at a supply shortfall as soon as 2028. Supplies of the most widely used cooling agent in Germany – R404a – will run out in 2020; R134a in 2030.

A question for many providers is: should I go for a natural cooling agent and accept higher plant costs or worse energy efficiency?

Conflicting information on the market, provided by refrigeration companies and manufacturers of cooling elements, cause many meat processing plants to shy away from investing in renewing their refrigeration or from carrying out energy saving improvements.

For established plants, operating cooled rooms with machines, the question is: Would a conversion be worth it; what can I save? A double figure saving can be achieved, just by optimising an existing cooling system. By renovating or renewing an existing system it is possible to make savings of up to 50%. Such savings are made possible by “neutral planning”. To further improve economic efficiency, the German government, via the Federal Office for Economic Affairs and Export Control (BAFA), will provide a grant of up to 100,000 € for the renovation or renewal of a cooling system. As a neutral engineering company for cooling and energy technology KB KälteBeratung (Cooling Consultants) from Koblenz, Germany, supports and delivers a customised solution for each individual plant.

Whether a natural cooling agent or a chemically based HFC the company will find a suitable concept and oversee the project, from the drafting the specifications to vetting tenders and comparisons through to construction supervision and securing your operational processes. The consultants will regularly monitor the installed system (in accordance with DIN ISO 50001) and inform the management of any deviation in sustainable energy efficiency. In order to be permanently incorporated into the whole plant, cooling technology requires efficient heat recovery, optimally configured to cope with the amount of the waste heat produced, and its utilisation.

With intelligent connection via a block-type thermal power station (BTP), a plant can generate its own electricity and heat. Both the electricity for the plant’s own consumption and the waste heat for use in production (warm water for washing, disinfecting or heating etc.) create a high equity yield rate. At times when there is no demand for high amounts of waste heat an absorption chiller can be run from the waste heat of the BTP which, in turn, reduces pressure from the “main cooling” and significantly reduces the demand for electricity.

If combined cooling, heat and power (CCHP) (Fig. 1) is utilised, 100,000 € for an absorption chiller and further grants for the BTP are available. Comprehensive concepts such as these allow existing systems to be renovated or renewed. Overheads and running costs can be significantly reduced to optimise the economic efficiency of a meat processing plant.

As opposed to a compressor cooling system, an absorption chiller requires almost no electricity. Absorption chillers are thermal cooling systems and use the waste heat of the block-type thermal power station to produce refrigeration. The use of an absorption can relief the compressor cooling system - which uses much more electricity – and provides refrigerating capacity with considerably cheaper thermal energy. The higher costs for investing in an absorption chiller can be offset by increasing the running time of the block - type power station and by its long life-span and virtually maintenance-free operation.

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