CASE STUDY

Energy efficiency combined with increased safety thanks to CO_2 refrigeration

Huesca, Spain

32% cuts in energy costs support Fribin's ambitions for growth

Fribin is one ot the most important beef producers in Spain and is one of the top producers of pork and charcuterie. The company offers meat of the highest quality in a responsible way, respecting the environment, guaranteeing human treatment of livestock. They produce more than 20,000 metric tons of beef and about 65,000 metric tons of pork per year and employ 450 people. Fribin is active in all Europe, exporting 50% of the production and reaches a turnover of 245 million euros a year.

- 32% savings on energy costs
- 29% less CO_2 emissions

Johnson Controls has been providing energy and sustainability services for Fribin, a leading actor in the European meat industry, headquartered in Huesca, Spain, since December 2000. The Johnson Controls Engineering team has worked closely with the Fribin Engineering and Maintenance team on a solution saving up to 2.600.000 kilowatt a year and to realize 380.000 euro savings. Improving the overall performance of the plant, the new equipment allows Fribin to deliver top-quality meat to its customers and provide a safe working environment to its employees.

Johnson Controls

Challenge: unifying the refrigeration installation

The plant was equipped with four machine rooms, dating from the 70's, the 80's and the 90's to refrigerate the production and to preserve the cold chain. In 2004, Johnson Controls replaced one of these machine rooms with a new cooling installation, consisting of 3 Sabroe screw compressors, with enough space for further extensions.

In order to improve the quality of the production and reduce long-term operational costs, Fribin sought operational reliability through carefully controlled temperature facilities. By reducing the production and energy costs, Fribin would increase its competitivity and its green credentials. Reliable equipment would prevent product contamination and reinforce employee's safety in case of a leakage.

Johnson Controls proposed to unify the remaining three machines rooms in the recently installed NH3 machine room, limiting the number of compressors installed and therefore the maintenance costs. The unification of the circuits allowed a better performance, consumption and control.

Achieving energy efficiency with undisrupted production

The implementation of the energy measures started in June 2013 and will end towards the end of 2014. Johnson Controls proposed to implement the following solutions in two phases, with no disruption of the production:

Phase One:

- Dismantle the three oldest room machines
- Enlarge the newest room machine with 2 new Sabroe screw compressors type SAB233S
- Replace the existing Tunnels and Cold Rooms to CO_2 (renew all the piping and the evaporators)
- Install CO_2 installation with high-pressure reciprocating compressors (two HPO28, one HPO24 and one HPC106S)
- Install a new installation of glycol for the working rooms

Phase Two:

- Install a Sabroe Heat Pump to generate hot water for cleaning

The compressors of this energy efficient and environmentally friendly refrigeration installation provide 5,245 kW at temperatures of -13°C, -29°C and -48°C, for a precise control of the temperature at any stage of the processes. The thermic energy delivered in the process is reused to produce hot water that keeps the working space clean and secure.

Preserving product and personnel safety with a natural refrigerant

Furthermore, it was decided to limit the ammonia to the machine room, in order to eradicate product contamination risks and personnel safety risks in case of leakage. CO_2 is a reliable natural refrigerant that does not damage the product and has no impact on the quality of the meat, allowing Fribin to preserve its production and stay on the market in case of leakage.

Achievements in energy efficiency

The visible positive effects on operating costs, process effectiveness and product quality as well as customer satisfaction is completed by achievements in energy efficiency:

- 380.000 euro savings a year
- 32% cut in energy costs
- CO_2 reduction of 29%
- Long term benefits : reduced production costs, safe products for customers, healthy working environment for co-workers

Energy efficiency encourages growth

To sustain its ambitions and increase the production by 30%, Fribin is planning to extend production in a five years plan, focusing mainly on the pork division. In the long term, Fribin aims to double the production. The installation has been conceived regarding these future extensions and will support Fribin's ambitions for growth in the coming years.

Fribin

"Fribin confied the complex project to Johnson Controls as we knew this complex project would require a lot of engineering and coordination. We trusted in the capabilities of Johnson Controls to manage this project successfully. Johnson Controls also analyzed the potential savings with this project. The energy analysis showed that technical interventions were necessary to meet the needs of the growing company, as well as the possible savings."

Juan Carlos Lles
Operations Manager

Johnson Controls