

Interest-free loans for heat recovery save dairy farmers 60% on energy

Heat recovered from milk cooling systems can be used to pre-heat washing water giving energy savings of 60%. And the energy savings could equate to £650 per year for a 150 cow dairy herd. A Carbon Trust zero interest loan is a great way to finance the £3,000 for the heat recovery unit.

The business case

It's ironic that the two largest energy costs for dairy farmers are associated with taking heat from milk - and then in another independent system, adding heat to water for cleaning. However, it seems intuitive that, if the heat drawn from the milk could be somehow used to heat the water, savings can be made.

This is precisely what a heat recovery system does. Rather than throwing away the heat from milk cooling, the hot refrigeration gases are passed through a heat exchanger into warm water. Installation of this technology is simple and can be retrofitted to any existing refrigeration system.

Each milking point requires 18 litres of water at a temperature of 85°C for circulation cleaning. Normally this is heated in an insulated vessel using an electric immersion heater. With a heat recovery system, water can be pre-heated for free to 55°C – saving 60% of the heating costs or about £4 per cow per year.

An additional benefit is that the milk cooling system will work more efficiently, especially in the summer months, as the cold water from the heat recovery system provides better cooling of the refrigerant gas.



Loans

“There is great pressure on dairy farmers to reduce costs and their carbon footprint. Heat recovery is a simple and effective way to achieve this and a Carbon Trust interest-free loan is an excellent way to fund an installation”.

Kate Cross, Knowledge Transfer Product Manager, DairyCo.

The technology

There are two main types of heat recovery system. One uses a plate heat exchanger which allows hot refrigeration gas to flow in one direction against thermally conductive plates whilst cold water flows the other way at the other side of the plates. The resulting preheated water is fed to an insulated storage tank. The second system uses a separate pre-heat tank that has either a heat exchange pipe running through it, or a double external skin with refrigerant gas running through the void between the skin layers.

At installation, the refrigeration engineer diverts the refrigeration gas line that runs from the compressor to the condenser coil through the heat exchanger.

The pre-heated water is best stored and used to feed a separate final heat tank which raises the water to the required washing temperature.

For further information on Carbon Trust interest-free loans and to apply online visit the Carbon Trust website on www.carbontrust.co.uk/loans or call 01865 885 846



Savings at a glance

Project details

400 litre capacity heat recovery vessel fitted into an existing conventional milk cooling set-up.

- Loan amount **£3,000**
- Cost of heat recovery tank and fitting **£3,000**
- Annual fuel cost savings as a result of heat recovery **£650**
- Additional saving in milk cooling energy costs **£150**
- Annual CO₂ savings **8.2 tonnes**
- Payback period **3.75 years***

*The loans are always rounded up to the nearest year, so this loan would be paid off over four years.

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We help to cut carbon emissions now by:

- providing specialist advice and finance to help organisations cut carbon
- setting standards for carbon reduction.

We reduce potential future carbon emissions by:

- opening markets for low carbon technologies
- leading industry collaborations to commercialise technologies
- investing in early-stage low carbon companies.

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