

Energy Efficiency in Dairy Sheds

Case Study: Mahana Blue heat pump at Glencairn



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A Mahana Blue heat recovery system was installed in the 50 bale rotary platform milking shed on the Glencairn Land Company Farm at Dipton.

At Glencairn the shed staff normally use a total of 800 to 900 litres of hot water each day to wash the milking lines and the milk storage vat. Before the heat recovery system was installed, all of this water was heated with electricity in two 500 litre dairy water heaters.

Mahana Blue heat recovery system

The Mahana Blue system uses waste heat from the hot refrigerant gas in the milk vat refrigeration unit to heat water to 85°C using heat pump technology. The heat pump looks similar to a small refrigeration unit and is usually installed close to the milk vat chiller. The heat pump runs at the same time as the vat chiller and produces a low flow of hot water that is used to re-fill the water cylinders over several hours.



The Mahana Blue heat pump installed beneath the milk vat chiller unit at Glencairn

Experience at Glencairn

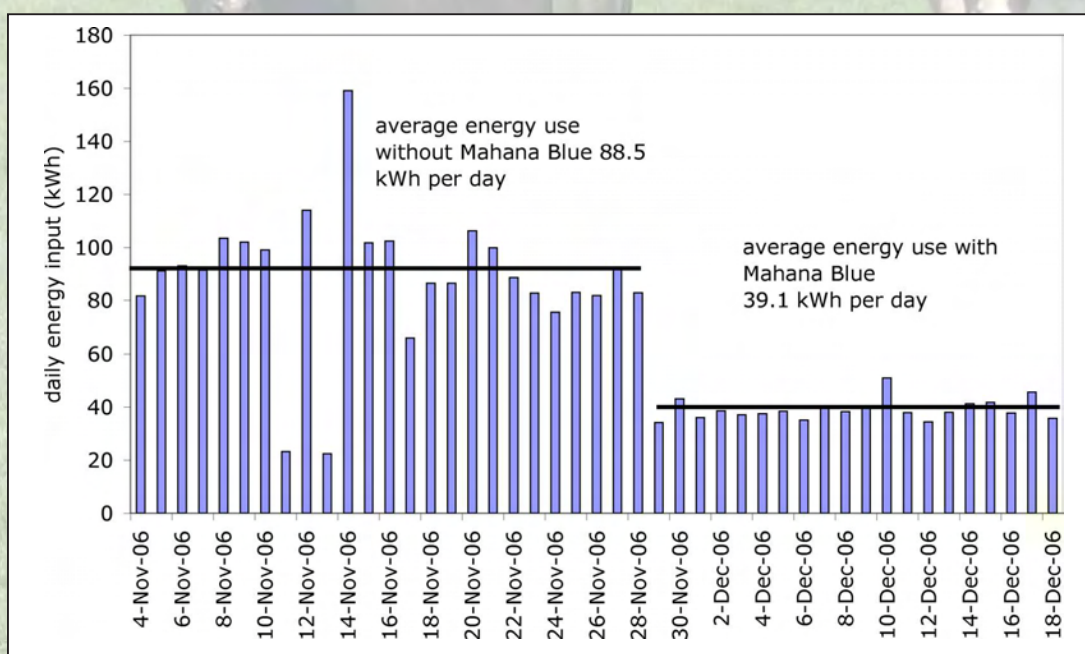
A Mahana 50 unit was installed in October 2006 at a total cost of \$9,700. Dairy shed staff quickly adapted to the new system and instead of refilling the cylinders with cold water after the morning wash, they left the heat pump to slowly refill them with hot water over the day.



Because the milk is picked up early (8.30am), most of the hot water is made between 2pm and 5pm. If necessary, hot water is available for an afternoon hot wash but at Glencairn this is not normal practice except during the colostrum period at the beginning of the season.

Electricity saving

The electricity used for water heating before and after the installation was monitored and on a typical mid-season day it fell from 88 kWh to 39 kWh – a reduction of 56%. The actual saving over a complete season hasn't been measured but electricity use at Glencairn is expected to fall by 13,000 kWh as a result of the new heat recovery system. At the present marginal cost of electricity (14 c/kWh), this saving is worth \$1,800.



Graph showing daily electricity use for water heating at Glencairn in November and December 2006