



# Reducing water heating costs

## The basics

Water heating accounts for about one third of energy use in a dairy parlour. Although a range of fuels can be used, most heaters are electric and use an immersion heater. As long as the tanks are well insulated, this is an efficient and flexible way of heating water. There are a number of different ways to lower the costs of heating, either by better management of the heater or employing alternatives to direct electric heating.

## In practice

The standard electric water heater comprises a well insulated tank with an immersion heater. The temperature needed for standard circulation cleaning is 86°C, therefore stored water temperature is very high compared with domestic use. For washing the parlour 18 litres of water is needed for every milking point, consequently your water heating capacity should be adequate enough to accommodate this.

Most heaters are fitted with a removable lid to facilitate easy cleaning and de-scaling. Sometimes these lids are badly insulated or ill-fitting and one cheap and easy step to reduce energy use is to improve these.



Heat loss through lid

## CASE STUDY

Geraint Puw of Corngafr Farm, Meidrim, Carmarthen, plans on replacing a Burco boiler, which heats water for his calf feeding, with a modern well insulated water heater. The change will potentially see him save 50% on the electricity costs that are incurred when heating water to the required 36°C.



The Burco is a convenient way to heat water quickly but its standing heat loss is very high. It would be better to install a standard insulated tank and heat water on the night rate electricity tariff. Well insulated tanks lose less than 5% of their heat in 24 hours. Therefore with cheap rate electricity operational costs will be about half that of the Burco.



Hot water pipes leading from the water heater should also be insulated to reduce heat loss.

When hot water is stored in a well-insulated vessel for a few hours it loses very little heat. It is therefore possible to pre-heat water using cheaper period electricity tariffs to minimise costs. Economy 7 is the most common cheap rate tariff, offering 7 hours reduced rate electricity during the night. It's nearly always economical to install enough water storage capacity to make sure all the water you require can be heated on the cheap tariff rates.



Hot water heater

## Heat Recovery and Renewable Heat

Water can be pre-heated by using the hot refrigeration gases from the milk cooling system in what is called a Heat Recovery Unit (HRU). In some cases this unit can contribute 60% of the energy needed for heating.

Using renewable energy is now a viable means of heating water mainly because of subsidies from schemes like the Renewable Heat Incentive (RHI). The RHI pays a tariff for each kWh of heat used from an eligible system. Tariffs are set for a 20 year period and apply to technologies like solar thermal, ground source heat pumps and biomass boilers.

Some of the technologies such as solar thermal and ground source heat pumps will not be able to heat the water to the final required temperature, but they can be configured to do a significant amount of pre-heating and therefore save you energy.



HRU

## Potential savings

The following potential cash savings (%) are available when compared with using day-time electricity. These figures do not take into account capital expenditure or the value of the RHI which can in some cases totally offset the cost of the fuel.

Technique	Saving
Economy 7 (night rate)	50%
Heat Recovery Unit	60%
Solar	40%
Heat Pump	65%
Biomass	80%



Solar thermal

**For more information on reducing water heating costs please contact:**

**Dairy Development Centre,  
Gelli Aur,  
Carmarthen,  
Carmarthenshire, SA32 8NJ.  
Telephone: 01554 748570  
E-mail: [ddc@colegsirgar.ac.uk](mailto:ddc@colegsirgar.ac.uk)**