10 Steps

Reducing the carbon footprint of **Tasmanian dairy**

6

Smarter Energy Use

Supported by:

DairyTas

Dairy Australia

LIC LIVESTOCK IMPROVEMENT

Tree Alliance

Tasmanian Government

Energy use on dairy farms accounts for around 10% of emissions generally.

Tasmania is part of the National Energy Market through Basslink; the percentage of coal-derived energy in the Tasmanian grid fluctuates with seasonal and national energy market drivers.

For irrigated dairy farms, irrigation is generally the largest source of energy emissions, depending on seasonal conditions. With increasing climate variability, farmers are more reliant on irrigation to maintain consistent pasture quality through drier months.

Irrigation - do the basics well

There is always someone happy to sell a technology solution to dairy farmers. However, good irrigation is 90% about doing the basics well:

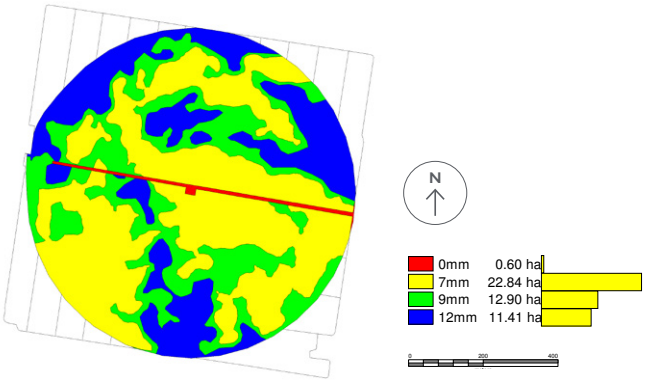
- Time and money invested in good independent system design will be worth it. Look at every opportunity to use gravity on your farm. Certified Irrigation Designers can help with system design
- Start up irrigation on time. Even a week late and you are on catch up for the rest of the season
- Get your scheduling right. Water stress and water logging events can have a significant impact on feed production, as well as contributing to leaching and poor soil structure
- Prioritise routine maintenance. Breakdowns create headaches and can impact the whole irrigation program
- It is false economy to compromise potentially tens of thousands of dollars of milk in the vat to save a few thousand dollars by prioritising off-peak power ahead of optimum pasture growth
- Check your irrigation pump tariffs and ensure you are maximising the use of off-peak and shoulder tariffs where possible eg. filling dams at night.

What about variable speed drives (VSD) and variable rate irrigation (VRI)?

Most dairy farmers already have variable speed drives (VSDs) fitted to their vacuum pumps in the dairy shed. VSDs vary the work and energy consumption of the motor, depending on the work it is doing. They typically have a role in irrigation for undulating pivot sites. With variable speed drive fitted, the motor can adjust its work according to the flow rate and pressure requirement at a particular point in the pivot's arc. This can result in significant energy savings.

The sites that benefit from VSDs may also benefit from variable rate irrigation (VRI). VRI adjusts the amount of water applied to different parts of the paddock. VRI is intended for non-uniform paddocks where the drier parts of the paddock need more water and wetter parts need less. VRI can be an expensive option and the benefits are only realised if every other facet of the pivot irrigation system is already optimised. Looking at the simple things like good drainage and the best sprinkler packs for your soil type should be a priority ahead of fitting VRI.

Pivot Site VR Irrigation Map



In the shed - do maintenance, get efficient, invest in renewables

Many farms can save money and reduce their carbon footprint by:

- doing basic maintenance. Get your plate cooler and refrigeration system serviced. Poorly performing plate coolers were identified as the main cause of wasted power in 200 energy audits

- having an energy audit and identifying inefficiencies in existing system

- investing in renewables. Every kWh of solar produced in Tasmania forces 1kWh of coal or gas off the grid in Victoria. The "10 Steps" project has funded a case study investigation of solar on Tasmanian dairy farms.

  Case study on DairyTas website
  www.dairyaustralia.com.au/dairytas-10steps

- STC's (Renewal energy rebate) pay one third the project cost, but reduce by each year on 1 January until 2030 when they will be expired.

- Solar Photovoltaics (PV) and Wind now the cheapest form of electricity, so minimal pressure to continue downward pricing.

- Install premium panels and inverters. Look for premium panels with "Product warranty" to 25 years, with a 40 year design life. Don't be mislead by 25 year "Production warranty" as this is typical

"Investing in solar for the dairy has been well worth it. We are working on a 5 year pay back. It is great to look up at the roof of the dairy and feel that we are doing something for the environment."

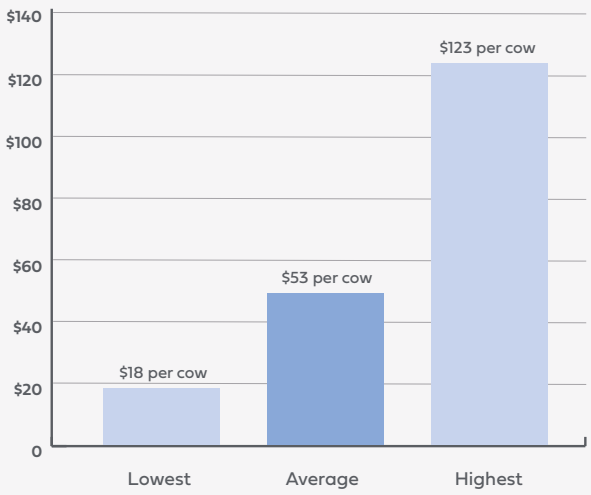
Grant and Kim Archer, Bracknell

Benchmarking energy use

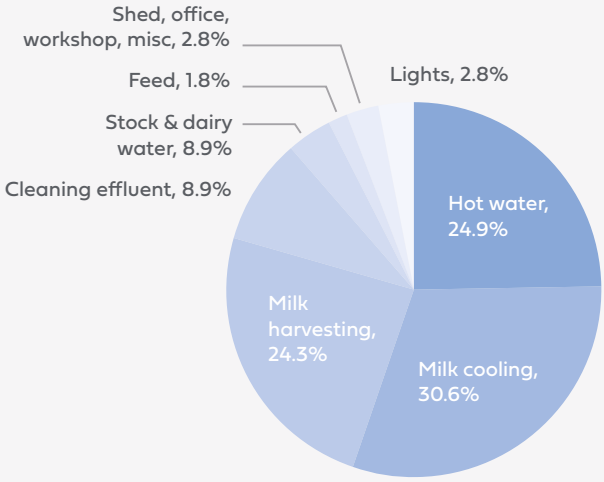
Dairy shed energy audits in 2012-2015 showed significant variation in efficiencies of Tasmanian dairies - see averages for 200 audits below. For benchmarking energy, the best comparison is cost per kL (1,000 L) because that accounts for variations in L per cow and MS per cow. The amount of energy used largely depends on the volume of milk physically harvested and cooled.

Cost per kWhr is what you are paying for electricity. Time of use contracts have different costs for peak, off-peak and shoulder. Maximising off-peak and shoulder use is a key strategy for reducing the overall bill. No dairy sheds should be on Tariff 22. Contact your energy provider if you are - you will be able to save $.

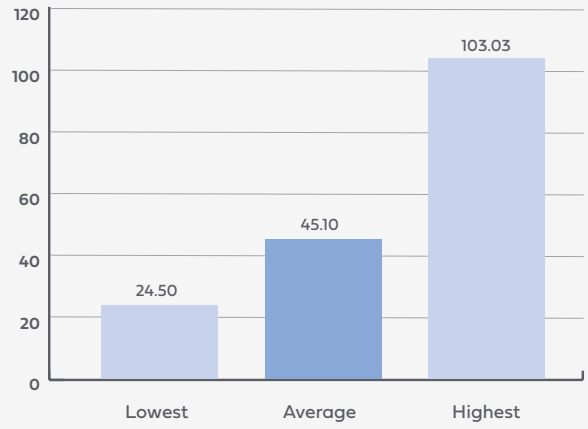
Energy cost per cow milked ($ per cow)



Breakdown of energy costs in the dairy - average across all sheds



kWhr per kL (1000L) milk production



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