# Top 5 quick energy opportunities

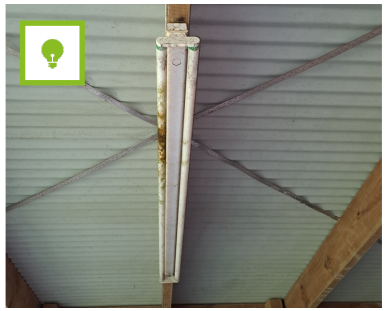
*"Getting Solar and closing our water systems was going to pay for itself in less than two years. I want to hand the farm on to the next generation in the best shape for them to be successful."*

## Vats and cylinders

Exposed metal on older vats, hot water cylinders and pipes: wraps can be installed to save energy.

Check for leaks.

## Lights



Get better lighting and save energy with LED lights.

Unsure if you have LEDs, photograph the lights and message the electrician to confirm.

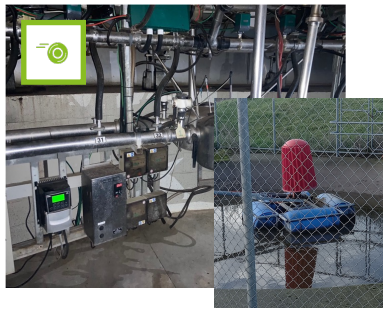
## Peak or off peak?

Save up to 30% with time-of-use or day/ night rates.

Add timers on hot water cylinders, ice banks, effluent pumps and more.

It also helps with solar PV payback.

## Pumps



Variable Speed Drives / digital controllers give better flow while protecting equipment and saving energy.

Not sure if you have these installed? Does the equipment have a box next to them and wired in? If not then you probably don't have a VSD/ controller.

## Solar Panels

Make sure you use all the power you generate. Turn on hot water, effluent and ice-banks during the daytime.

Ensure you select the right equipment so it can work in a power outage.

May also suit small, separate connections, e.g. water pump at runoff.

| | Vat | Hot water | | | | PPA | Own |
|---|---|---|---|---|---|---|---|
| Savings | $500-1,500 | low | $300 | 30% | $1-3,000 | low | $5-15,000 |
| Investment | $300 | low | $1,500 | Nil-$1,000 | $6,100 | nil | $50-150,000 |
| Payback years | >/= 0.5 | short | 5 | <1 | 2-6 | short | 5-12 |

# Taking action

## Top five quick energy opportunities (page 2)

Tane chose **LED lighting** simply for better light.

Changing the most used lights, and adding a switch to turn these on/off, boosts savings.

For Angie, **timers** were a simple step to bill savings (and carbon cuts) for hot water cylinders, ice banks and effluent pumps. The electrician helped calculate loads, run times and settings, and installed timers for best use of **solar PV**.

Pete gets multiple benefits with efficient pumping with **variable speed drives (VSDs)** and **digital pump controllers** (e.g. F60s) including:

- lower water cost
- reduced waste water
- better plant life/reduced risk
- energy savings
- leak/burnout detection.

Debbie cut her exposure to energy price rises and prepared for resilience by adding **solar panels** on the farm. She ensured proper design for actual daytime loads that helped the payback.

**Timers** on hot water cylinders, ice banks and effluent pumps means that when we use power better matches solar PV.

Doing ground works themselves helped cut costs - but installers were happy to do everything too.

## Your Quick Steps

**Insulate VATs**

- Fonterra can advise you on your VAT type/ size

**Wrap hot water cylinder, lag pipes and fix leaks**

- For cylinder wraps call your plumber (can also self wrap)
- Pipe lagging must suit temperature and pipe diameter

**Install variable speed drives and pump controllers (e.g.F60s)**

- Call your pump supplier
- Check all pumps (see our advice)

**Install LED lighting**

- Call your electrician

**Install timers**

- Call your electrician

**Install solar panels (PV)**

- User timers/smarts
- PV has pay-as-you-generate (Power Purchase Agreement or PPA) and other finance options
- See the solar panels guide for more on what to ask, look for and consider

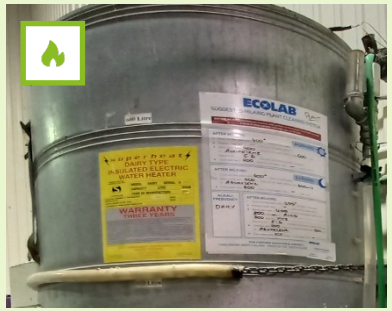
Financial insights are illustrative based on generic information. Specific sizing, costing and benefit assessments are recommended. Version 14/1/24

# Are these top energy saving investments in your Farm Plan?

*"We wanted a farm that was labour efficient. So, we needed to invest in good automation and monitoring.*

*As an off shoot we also got energy efficiency. Our rule was payback within half the warrantied life"*

## Hot water heat pump




Replace cylinder(s) with hot water heat pumps.

Running costs 25-35% of old cylinders; 50% of gas hot water, but re-plumbing needed

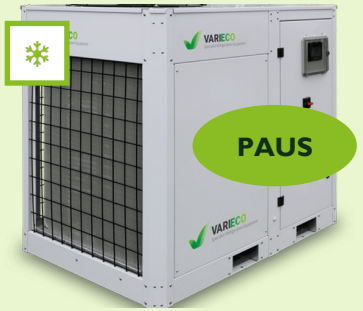
## Heat Recovery


Hot water for cleaning is pre-heated.

This is from the waste heat in chilling and dumped wash water.

Can reduce water needs/ waste and improve farm resilience (less energy needed).

## Snap Chilling




30% energy efficiency for cooling, plus heat recovery.

Higher capital cost options often save more over life and cut emissions.

FarmSource partners are Coolsense (incl. Fonterra exclusive Pay As You Save – PAUS - option) and DTS.

## Yard Washdown

Consider water and effluent savings by moving away from a high water use wash system.

You can make the most energy savings where there is significant pumping (distance or elevation).

Consider installing a low water system e.g. a "dung buster" scraping system on backing gate.

## Precision Irrigation

Precision irrigation claims up to 50% water reductions. Energy savings are a by-product.

Nanobubble technology can also save 15-25% (not in costs/ savings below).

| | | | PAUS | Own | | |
|---|---|---|---|---|---|---|
| Savings | 50%+ | 30%/ $10,000k pa | Lower | 30% | Good | Good |
| Investment | $10,000 | $45,000 | Minor | High | Minor increment | Minor increment |
| Payback years | 11 | 4-5 | <1 | Varies | Short | Short |

# Taking action

## Top energy savings for your Farm Plan (page 2)

### Plan now for renewals

**Estimate renewal date**

**Update your Farm Plan**

**Talk to supplier(s) well in advance**

**Hot water heat pump to replace cylinder**
- On cylinder renewal
- Heat pump most beneficial for new shed

**Install heat recovery**
- On chiller renewal

**Install snap chiller**
- On chiller renewal
- Check FarmSource partners
- Coolsense offer Pay As You Save and reduced greenhouse gas from refrigerants

**Yard Washdown**
- Water use, water cycle, scraping gates
- Timing depends on opportunity/ related investment

**Precision irrigation**
- If you use significant irrigation and assessing for other reasons, consider energy savings

Hot water heat pumps are energy efficient so ideal for Sue's new shed. More work e.g. re-piping is needed for replacements of existing cylinders.

For Ray, assessing the best heat recovery option well ahead of chiller replacement not only saves on hot water, but gets it quicker – reducing risk.

For Bob, choosing a snap chiller was about milk quality. But for the same or little extra money, energy efficiency and reduced greenhouse gases boosted the benefits.

Adding the scraping gate has helped Chris cutting effluent and water use, with the bonus of energy savings on reduced pumping.

Smartly irrigating, for Mark, drives water use and stock health, but planning for energy efficiency adds to the return.

Financials are illustrative based on generic information. Specific sizing, costing and benefit assessments are recommended. Version 14/1/24

# Top energy saving operational choices

Changing what the team does, or checking what service technicians cover, can find immediate savings for low or no cost
Use the check lists below to confirm what the team is doing and identify items for action.

## Dairy shed

| | | |
|---|---|---|
| **Plant renewal plans** | Plan in place for what to buy when you have plant failure | ☐ |
| | Energy efficiency included as part of that decision | ☐ |
| **Plant service schedules** | Your refrigerant plant is checked annually | ☐ |
| | Your milk plant is checked annually, e.g. vacuum regulation, airflow, leaks, drive belt | ☐ |
| | Water leaks are spotted quickly (e.g. excess pumping) | ☐ |
| **Set point temperatures** | Your hot water cylinder temperature is checked and optimum (55C at end of wash) | ☐ |
| | You have considered a hot water wash every second day (efficient plant set ups) | ☐ |
| | Regular temperature check of your milk cooler water and milk outlets | ☐ |
| **Switch off unused plant** | Unused hot water cylinders | ☐ |
| | Lights off after milking | ☐ |
| | Your pumps | ☐ |

## Diesel and time savings

| | | |
|---|---|---|
| **Feeding practices** | Feed stored in more than one location to save time and reduce tractor miles | ☐ |
| **Frequency, choice & care of vehicle** | Plan for multi-purpose trips to save time and fuel | ☐ |
| | Use the smallest appropriate vehicle for the job at hand (tractor size, ute, quad, motor bike) | ☐ |
| | Check tractor servicing, tyre pressures and choose settings for the job/ load (check visor/ manual quick guide) | ☐ |
| | Electric options include ubco or e-bike, Tuatara electric quad, electric ute and tractor (light duties only, high cost) assessed | ☐ |
| **Using contractors** | Using contractors more often as they tend to have right sized and most modern vehicles, reducing fuel and carbon | ☐ |
| **Herd wearables** | Assess energy efficiency gains when assessing wearables | ☐ |
| | If using them, reducing the frequency of trips (miles) as wearables allow | ☐ |