Victorian Energy Upgrades

Case study

The Large Energy User Electrification Support program

Saputo Dairy Australia is on the journey to electrifying for a cleaner, cheaper future.

Saputo Dairy Australia (SDA), a leading dairy processor, has been exploring energy efficient upgrades to lower costs and emissions.

As part of the Victorian Government's Large Energy User Electrification Support program, SDA used a $37,400 grant to undertake an electrification feasibility study to explore potential electrification opportunities at its Kiewa site. The site consists of two main factories housing 1 x 5MW and 1 x 6MW natural gas-fired boilers.

The program is a $1.6 million initiative helping Victorian commercial and industrial gas users identify ways to electrify their operations to reduce energy use, cost and emissions.

The study at Kiewa, conducted by a third party approved supplier, examined three opportunities which included the installation of a CO_2 high-temperature heat pump, replacing gas-fired boilers with a 2.7MW electric boiler to provide steam, and replacing gas-fired HVAC systems with an electric Variable Refrigerant Flow (VRF) system.

The study found that:

- Installing a CO_2 high-temperature heat pump could reduce the site's gas usage by 48% while increasing electricity consumption by 12%. This heat pump would offset 1.4 MW of heat supplied by the boilers and meet existing demand of the two ammonia chilled water plants.
- An electric steam boiler would be required to fully electrify the site, as some steam demand cannot be converted to hot water. However, there is currently insufficient electrical capacity onsite to support an electric boiler.
- Replacing the gas-powered HVAC system with a VRF system that provides heating and cooling could reduce on-site gas consumption by 11% and increase electricity consumption by 5%.
- Successful implementation of the pump could maximise the use of hot water – rather than steam – for heat load, leveraging the superior efficiency of heat pumps (specifically transcritical CO_2, the only commercially viable technology for the required temperatures) to meet site heating requirements for manufacturing processes.

Installation of the high-temperature heat pump could save SDA:

$605,000 annual energy savings cost and offers a simple payback of five years with a net present value of $2,990,000.

39,800 GJ reduction in gas use per year.

48 per cent reduction of the site's annual gas use, saving **2,050 TCO_2 per annum**.

VEU incentives potentially worth up to **$1,057,410**.

Sustainability Victoria

VICTORIA State Government

Installation of the electric Variable Refrigerant Flow system could save SDA:
$110,000 annual energy savings cost and offers a simple payback of **three years** with a net present value of $950,000.
9,200 GJ reduction in gas use per year.
11 per cent reduction of the site's annual gas use, saving **470 TCO_2 per annum**.
VEU incentives potentially worth up to **$16,920**.

Building Victoria's renewable energy future

The Large Energy User Electrification Support program forms part of the Victorian Energy Upgrades (VEU) program, the flagship program which helps Victorians upgrade their homes and businesses with energy-efficient products and services by offering discounts and rebates.

SDA was one of 36 facilities which participated in the program. Grants of up to $60,000 per facility were available to support innovative electrification feasibility assessments of commercial and industrial businesses that use between 10 to 100 terajoules of gas per annum.

These feasibility assessments provided a business case for bespoke energy efficiency upgrades through the VEU program's Project Based Activity (PBA) method, such as upgrading hot water boilers, furnaces, ovens and dryers, by tailoring the best way forward to transition from gas to electricity.

Homes and businesses which become more energy-efficient through the VEU program allow accredited providers to create Victorian Energy Efficiency Certificates (VEECs). Each certificate represents one tonne of greenhouse gas prevented from entering our atmosphere.

If pursued, the high-temperature heat pump and electric variable refrigerant flow system could generate 11,937 VEECs, or up to $1,074,330 in financial incentives for SDA.

Approved businesses sell these certificates to energy retailers. This sale funds discounts and rebates which are given back to homes and businesses.

Energy retailers use the certificates to meet annual emissions targets set by the Victorian Government.

Questions?

For more information on switching to electrification see the VEU page at www.energy.vic.gov.au/victorian-energy-upgrades/about

T (03) 9032 1310
E energy.upgrades@deeca.vic.gov.au

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