Fonterra clean energy shift not so simple

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http://www.stuff.co.nz/business/farming/74099939/no-single-answer-to-lowering-fonterras-energy-footprint

There is no quick fix to improving Fonterra's energy footprint, but the dairy co-operative says it is working hard to reduce its environmental impact among its processing plants.

The dairy co-operative is one of the country's largest burners of coal for thermal energy, using it to power 10 out of 29 of its manufacturing sites, with seven of those sites in the South Island.

It also generated thermal energy from gas, light fuel oil, or biogas fuel sources, or from on-site co-generation facilities.

Altogether, this comprised 85 per cent of its energy needs with the remaining 15 per cent generated from electricity.

Fonterra took a whole farm perspective with its energy policy, spanning the time its tanker fleet collected milk to when it left the factory as a finished product to be exported overseas, the cooperative's programme manager energy and utilities Tony Oosten said.

"There is no one single silver bullet. It's similar to food safety and quality, it's about how do we make sure we do a lot of things efficiently the whole way through the supply chain."

Processing in excess of 20 billion litres of fresh milk a year around the world at its plants was energy intensive. The milking season was just coming off its peak where 40 per cent of its seasonal production was collected over those three months. This season so far, 87 million litres of milk had been collected, equating to a farm pickup of every 8-9 seconds across the country.

Fonterra energy manager Linda Thompson said they use their coal as efficiently as possible and buy emissions units to offset the coal that is used in the plants.

The particulate matter emissions from the coal are also reduced using baghouses.

Its energy policy focused around energy affordability, security and sustainability. That meant looking at every gigajoule of energy it used and making sure it was used wisely including yearly boiler tune ups and inspections.

Security of supply was central to whatever energy source the coop's plants used, particularly over the peak milking period.

"We have to have security of supply for end to end sustainability, we need to be able to process that milk every day and we don't want to have a plant downtime due to an energy supply issue," Thompson said.

Fonterra claims it has few choices for energy options in the South Island other than coal. They were constantly exploring alternatives to coal but had yet to find one that was economically viable, the co-operative's director of New Zealand manufacturing Mark Leslie said.

"We don't have other options in the South Island as of yet. We are doing what we can to reduce our reliance on coal but at the moment it is a reality for a third of our sites." "We have looked at numerous case studies to try and get one to stack up economically for us," Thompson added.

According to 2013 data from the Ministry of Business, Innovation and Employment, New Zealand's largest company used 410,000 tonnes of coal to turn liquid milk into powder, earning a total revenue of $22 billion in 2014.

Altogether the dairy industry burns 512,811 tonnes of coal.

Based on one tonne of coal producing 2.86 tonnes of carbon dioxide, Fonterra's coal-powered factories pump out 1.17 million tonnes of the climate warming gas.

Add to that its gas-powered plants and tanker fleet, and the company becomes one of New Zealand's top greenhouse gas polluters.

In 2013, 4.6m tonnes of coal was produced from New Zealand mines, of which 2.1m tonnes were exported. Of domestic users, the largest are the Glenbrook steel mill, Huntly power station and Fonterra.

Fonterra owns Glencoal as a subsidiary. The North-Waikato coal mine has been in operation since 1922 and currently its Kopako 3 area is being mined, providing coal its Te Awamutu site.

Its past mines have been restored to grassland or native bush. The coal ash is returned to the disused mine area and covered with soil and the area extensively replanted.

Nearby streams have also been restored, ponds created, waterways fenced and riparians planted. At the end of the life of Kopako 3, which is expected to be some time in 2016, the mine will be turned into a lake. It will take two to three years to create the 25ha lake and part of Fonterra's consent conditions is that they monitor the lake's water quality and fish life.

A Fonterra spokesman said the co-operative was still looking at its energy supply options once that mine ran out. Thompson said Fonterra also aimed it reduce its

emissions and use its resources efficiently. It had reduced their gigajoules of energy per tonne of product made by 16.8 per cent since 2003. This amount of saved energy would be enough to power all the households in Wellington City for more than two years.

This was achieved by auditing their energy usage at the plants.

This had enabled them to improve their boiler efficiency from 87 per cent to 93 per cent using economisers at their Litchfield and Pahiatua plants.

The co-op had also invested in 900-1000 smaller projects across the country to improve its energy efficiency.

"Every one of those adds to the little bits of efficiency," Leslie said.

At its Te Rapa plant for example, its trucks drove a loop where it was loaded up with finished products and shipped them to its storage site at Crawford Street in Hamilton to be loaded onto containers for export.

Conversely, these trucks would ship ingredients back from Crawford Street to its factories to go into products. These trucks would run full the entire time, adding to its efficiency savings.

"It's a combination of all of those things that's driving towards an efficient outcome." This factory was also a target plant chosen by the co-op to host numerous energy focus projects undertaken during the off-season shut down period.

These included heat recovery, installation of LED lighting, and insulation.

Leslie said the coal usage was not hurting them in the marketplace because its customers took an end to end outlook to their energy use.

"They are more focused on broader sustainability." The company was audited around 2500 times a year and these checks range from those necessary under New Zealand's regulatory framework to large customers such as Nestle. These visits included checks on Fonterra's processing plants as well as its farms.

These were "very rigorous", often taking at least two days.

Apart from the standard checks, there were also questions around topical issues of the day such as energy sustainability, or new emerging high profile issues from around the world.

Looking ahead, the type of energy used at any new plant build by the co-op would be determined largely by its location and Fonterra had studied a wide range of alternatives energy sources to coal including, wood, geothermal, wind and biogas, Oosten said. One of the most promising alternatives was solar panels to power its storage facilities at its plants. The costs with using these panels was dropping all the

time. In India it now costs US$0.03 for every kilowatt produced from panels where the user signed a contract and bought the electricity off a provider.

"It's one of the ones we keep looking at because the technology keeps changing all of the time. It's no for now, but not no forever," he said. Fonterra had investigated accessing geothermal pockets caused by man-made water extraction to power its Waitoa factory, but the costs of extracting the hot water using a process similar to fracking outweighed the benefits. Growing miscanthus plants to be harvested, baled and burned as fuel was being closely looked at in the South Island and potentially co-firing it in coalpowered boilers. Fonterra has a 2ha trial plot of the plant near Darfield. Leslie said Fonterra's boilers are 'right sized' for each plant and there was no excess capacity. Fuel was needed to be put in that had a similar energy content to coal if it were to be replaced. "The problem is that it's so light and fluffy that it doesn't go into our boilers like that," Leslie said.

The cooperative has come under criticism from the Greens and groups such as the Coal Action Network for its use of coal, but he said the logistics of using wood as an alternative to coal to fuel those plants that used coal did not stack up economically or environmentally.

"You're spending a massive amount of money in diesel to collect that wood, diesel to move that wood, it's actually from an environmentally sustainability perspective it's not economically or sustainably sensible."

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