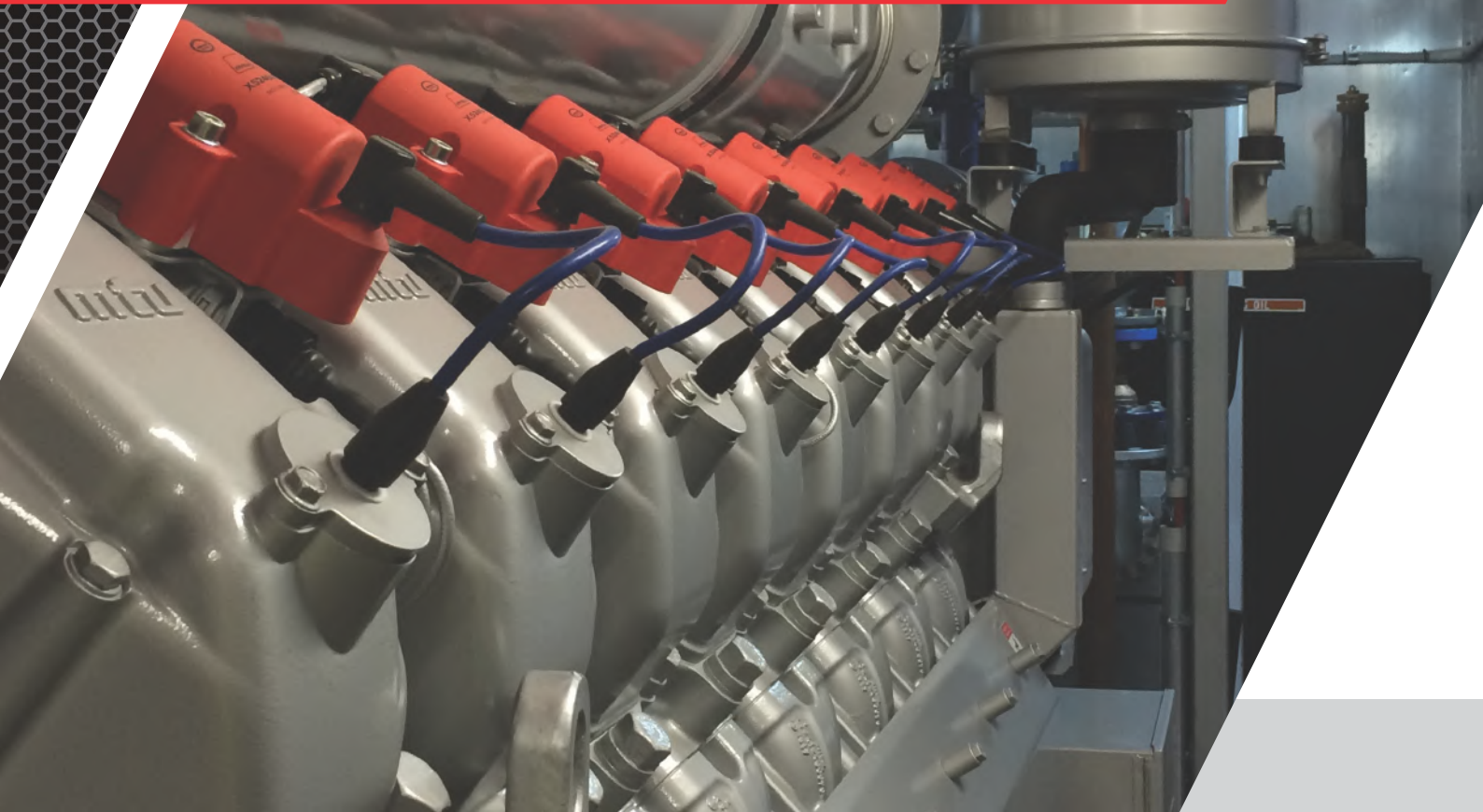


# Bulla Dairy Foods, Colac – Victoria



**Bulla Dairy Foods is an iconic brand trusted and loved by Australian families since 1910. The family-owned company has been making premium quality dairy products for more than a century, and its products stand for quality and authenticity.**

Today Bulla offers a range of chilled and frozen dairy products – including cream, cheese, yoghurt, dairy desserts, ice cream and frozen yoghurt – renowned for the taste of country goodness and real dairy.

Bulla's products include the iconic Real Dairy ice cream range, full of rich creaminess, as well as the much-lauded Bulla cream range that is the first choice of Australia's top chefs.

With the company experiencing exponential sales growth throughout Asia-Pacific, including the discerning Japanese market, Bulla remains the biggest selling cream on the Australian market today and is one of the country's major ice cream makers.

#### CUSTOMER

Environmental Technology Solutions (ETS) for Bulla Dairy Foods

#### LOCATION

Colac, Victoria

#### DESCRIPTION

Penske Power Systems partners with ETS for the installation of two cogeneration modules at Bulla Dairy Foods' state-of-the-art Colac facility; supplying and commissioning the modules, while ETS designed and managed the construction of the complete system

#### OPERATIONAL DATE

July 2014



All of this success is underpinned by Bulla’s diversity in production and technological innovation, which has been reinforced through continuous work in sustainability and efforts to generate electricity onsite.

Thanks to a significant grant from the Australian Government’s Clean Technology Food and Foundries Investment program, Bulla has installed two MTU Onsite Energy cogeneration modules to provide 80 per cent of the power requirements for its Colac frozen dairy manufacturing plant.

The 2.8 MW cogeneration system installed at Bulla’s Connor Street ice cream factory has been scoped to improve the company’s green credentials and reduce its overall energy costs with the entire project set to reduce Bulla’s site-specific carbon footprint by an impressive 55 per cent.

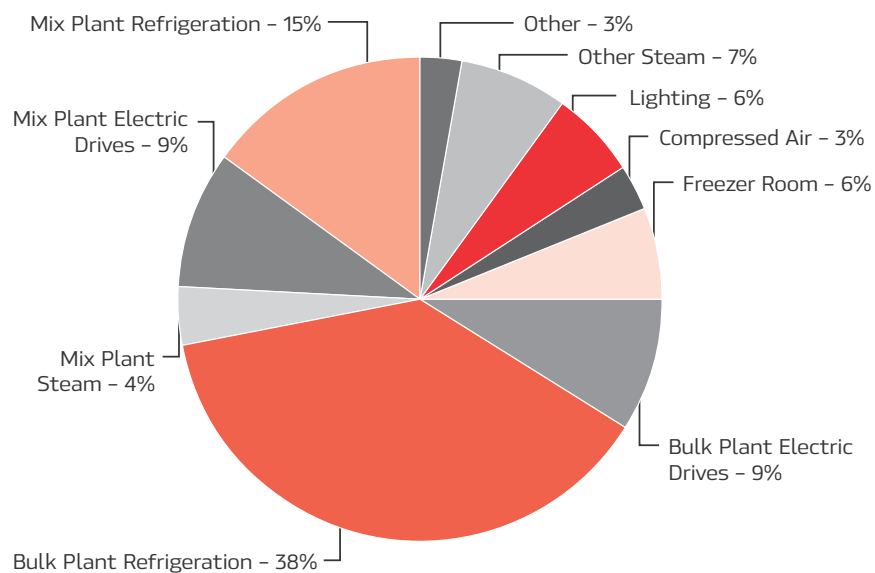
Looking at the breakdown of emissions from Bulla’s manufacturing process, which is mainly driven by electricity (86 per cent) and natural gas usage (11 per cent), it’s evident that Bulla’s quest



for improved sustainability would be aided through a cogeneration set up.

In fact, further analysis of Bulla’s carbon footprint indicates that most electricity is consumed by the refrigeration process, especially the freezing of ice

## CONTRIBUTIONS TO THE CARBON FOOTPRINT AT THE BULLA ICE CREAM PLANT





*The MTU Onsite Energy modules produce all of Bulla's required base load power and optimise energy efficiency*



**Left:** The 2.8 MW cogeneration system installed at Bulla's Connor Street ice cream factory by Penske Power Systems has been scoped to improve the company's green credentials and reduce its overall energy costs.

cream, which is taken care of at its Connor Street manufacturing plant.

To make this project a reality, Penske Power Systems partnered with Environmental Technology Solutions (ETS) to commission, supply and install two MTU Onsite Energy cogeneration modules.

ETS, meanwhile, designed and managed the construction of the complete system, in a complete turnkey solution.

ETS selected MTU Onsite Energy's natural gas-fired generators from the renowned Series 4000 platform – specifically the GR 1169 N5 genset that features the 12V 4000 L33 engine, and

the GR 1718 N5 genset that features the 16V 4000 L33 engine – to deliver continuous electricity and heating, as part of the cogeneration configuration.

Delivering 2878 kW<sub>e</sub> of electricity, the combined MTU Onsite Energy modules produce all of Bulla's required base load power and optimise energy efficiency by using waste heat to feed hot water to two newly upgraded boilers.

With a comprehensive control system for full monitoring and unmanned operation, the package parallels seamlessly to the grid while providing full protection for the plant's operations. The modules are also specified with heat recovery units, which

makes integration to the plant's thermal system simple and straightforward.

According to Mohsen Elnashar, Controls Engineer at Penske Power Systems, a major selling feature for Bulla was the module's "ability to automatically adapt to heating requirements, and its attuned heat recovery control management, ensuring continuous and stable operation."

Also of benefit was the payback value for the proposed cogeneration system, which was positive by the fifth year of operation at over \$8 million over a 20-year term. This represented a very attractive investment to Bulla.

The MTU Onsite Energy module also delivers improved electrical and thermal efficiency, further lowering costs. In fact Bulla expects the project to save it over \$1 million in electricity costs, in the first year alone.

Bulla's ice cream factory uses 25 per cent of the Colac township's power supply, and so by producing electricity in-house the company has increased the capacity of the grid.

According to Tony Vassallo, Power Generation Commissioning and Technical Specialist at Penske Power Systems; "The real benefit of our install is that the new gensets are using gas to produce electricity and steam, where the old boilers were using gas to produce steam only."



*The payback value for the proposed cogeneration system ... represented a very attractive investment to Bulla*

**Right:** The exterior of the soundproof enclosure that houses MTU Onsite Energy's GR 1169 N5 genset, featuring the 12V 4000 L33 engine, and the GR 1718 N5 genset, featuring the 16V 4000 L33 engine.





Explaining the process of harnessing exhaust heat for energy conversion, Tony adds: “43.2 per cent of energy from the gas is used to produce power. As part of this process, and thanks to our cogeneration modules, waste heat that passes through the exhaust is actually recovered to make steam.”

“That is where Bulla saves their money: instead of paying two bills, one for electricity and one for steam, they pay one gas bill for both.”

Showing Penske Power Systems’s marketing team through the site for the first time, Tony is the first to credit the work of ETS: “These guys have done a really great install”. However he’s all praise for the MTU engines; “These engines are just quality”.

The module is not only impressive, it is also intricate due to the safety and compliance issues associated with gas engines. “There are a lot of interlocks and safety systems that our engineers have spent a lot of time perfecting for this to run like clockwork – to do this our guys are in fact working out how to make things not run so that we enhance safety.”

The mastermind behind the engine is the ECU 7 engine control system, where “all the magic



**Above:** The new generation MTU Onsite Energy natural gas powered Series 4000 meets the increasing demand worldwide for decentralised energy and heat supply, with maximum performance, efficiency and low emissions ratings.

**Left:** Tony Vassallo, Power Generation Commissioning and Technical Specialist at Penske Power Systems, checks vital operation levels at the “nerve centre” of the system by using the MTU Module Controller.

happens”, including the control/protection of the engine and monitoring of the combustion process.

Tony guides the Penske Power Systems marketing team through the other fixtures of the enclosure, stopping at the MTU Module Controller, MMC, or the “nerve centre of the system”.

“The great benefit of the MMC is its remote access capabilities. That means that wherever I may be for work, which may be in remote parts of Darwin,

I can log onto our monitoring system and access the MMC. So, I can basically see whatever the plant operators see onsite, which from a service point of view means that our response time is down to a couple of minutes.”

On top of the enhanced serviceability and minimising of down time, the true market edge of the MTU Onsite Energy system is the package’s gas compliance: “We supply the engine, alternator, controls, gas frame and heat recovery unit as a complete cogeneration package, where a lot of our competitors will supply only the engine and alternator,” says Tony.

So how does it all work? Gas comes in and is mixed with oxygen. The computer senses pressure in the manifold and works to continuously adjust the gas and air mixture for the best horsepower and emissions ratings.

This all gets compressed into the turbocharger and goes through the intercooler (where the mixture is cooled) to create density, so that it produces a better combustion.

When the mixture passes through the throttle and into the cylinders, combustion occurs. All of this comes back out again and goes through the two-sided turbo, the hot side and the cold side, to provide a further boost.

Within the heat recovery unit there is a heat exchanger, so if a customer wants to use hot water from the system they can pipe directly into it, to extract hot water for their processes.

Tony goes on to say that: “Everyone talks about turnkey, but this Bulla job is the real deal. This is where a team of people collaborate on a project for 12 months.”

“In this instance Penske Power Systems scoped, supplied and commissioned the entire genset system for the project, while our client ETS pieced a comprehensive package together, including boiler purchasing, grant applications, electrical and gas connection, building demolition and much more.”

**Below:** MTU Onsite Energy power was selected to deliver continuous electricity and heating, as part of the cogeneration configuration at Bulla’s operation.





*The true market edge of the MTU Onsite Energy system is the package's gas compliance*

## MTU ONSITE ENERGY SERIES 4000 GENERATORS

The new generation natural gas powered MTU Series 4000 – with an electrical output range from 1000 to 2500 kW – meets the increasing demand worldwide for decentralised energy and heat supply.

It also sets the standard for maximum performance, efficiency and low emissions ratings.

### Designed for maximum performance, with:

- Significant increase in the effective engine power to 130 kW per cylinder
- Downsizing effects by the achieved power increase
- High power density combined with compact construction by significant average pressure increase.

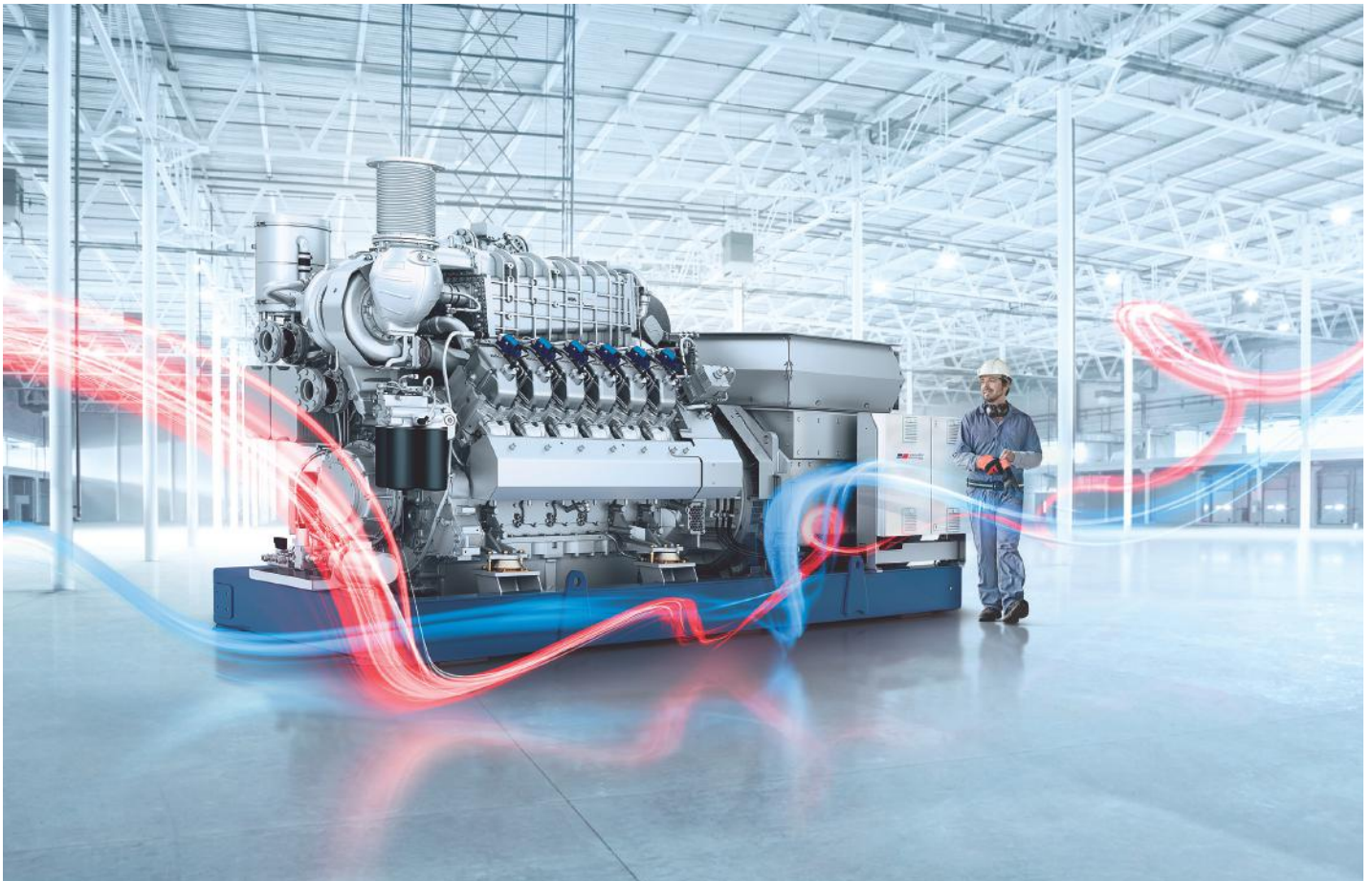
### More efficient than ever before, with:

- Significant increase in the electrical efficiency to a peak value of up to 43.2 per cent, delivering a significant improvement in the fuel conversion rate with a high temperature level
- Long service life and maximum availability by optimum synchronisation of all components
- Low maintenance costs and longer service intervals, as well as low-maintenance components that are easy to service
- Lower lifecycle costs.

### Cleaner than ever before, with:

- Significant reduction in nitrous oxide emissions (NOx) by optimising relevant engine components.

**Below:** The MTU Onsite Energy Series 4000 sets a new standard for efficiency and power, with an electrical output range from 1000 to 2500 kW.



Contact our Power Generation team  
via 1300 688 338 or [penskeps.com](http://penskeps.com)



*Power Systems*