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Toast of the town

Refrigeration a key ingredient at Burleigh Baker

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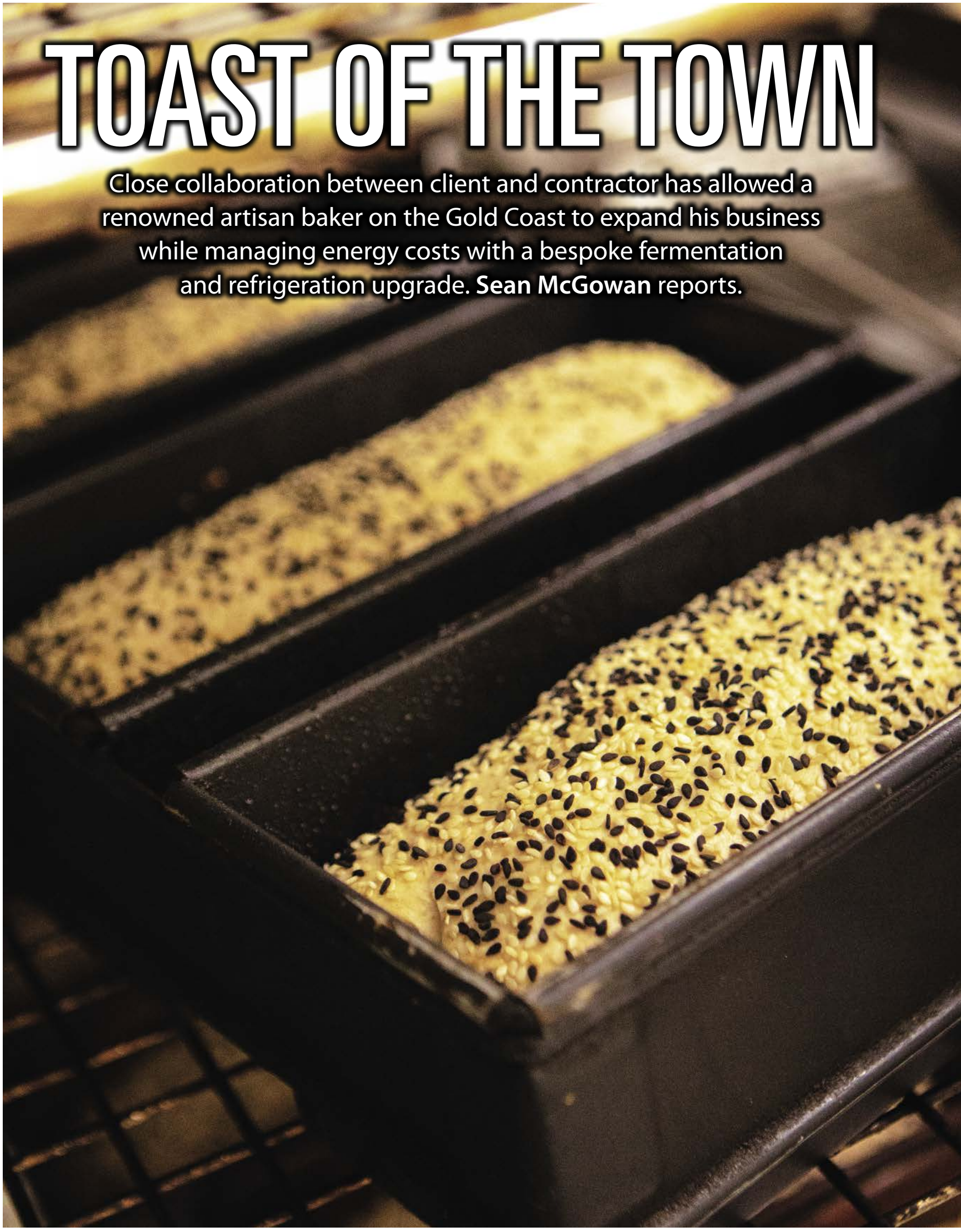
TOAST OF THE TOWN

Close collaboration between client and contractor has allowed a renowned artisan baker on the Gold Coast to expand his business while managing energy costs with a bespoke fermentation and refrigeration upgrade. **Sean McGowan** reports.



Contractor and client relationships – Daniel Bailey (left) and Jason Fisher (centre) from Elite Refrigeration with "The Baker" Geoff Dance.

Known always as a famous surf town, Burleigh Heads is now a thriving, diverse village offering some of the Gold Coast's best cafés, bars and restaurants.

Burleigh's James Street is a weekday morning favourite of locals, as well as a weekend destination for those who travel from further afield.

It is here that Burleigh Baker, an artisanal sourdough bakery, has become a local icon. The bakery was established by agricultural economist and former marketing executive Geoff Dance and his wife Lisa.

Both passionate about food integrity and the promotion of gut health and nutrition through their naturally fermented range of products, the couple have become members of the community and played a part in contributing to the village's evolving "foodie" reputation.

In fact, you'll frequently find them at the café, ready to chat about the importance of properly fermented breads and natural foods.

"A community's local baker should be known and trusted," says Dance, referring to a concept he calls 'the face of the baker'.

"It's important that people know where their bread comes from and who it's made by," says Dance. "This is one of the reasons we started Burleigh Baker."

As demand for their bread products grew, a second bakery was opened in Paradise Point, at the far northern reaches of the Gold Coast. A dedicated bakehouse at Varsity Lakes has also been established to cater for the growing wholesale demand of their hand-crafted produce.

COOL AND SLOW

According to Burleigh Baker, crafting the best sourdough bread is a journey that starts with the fermentation process, and relies on the skill of the bakers and the quality of the ingredients – certified organic and sustainable flours, leaven, sea salt and filtered water.

In line with the company's food integrity values, a long, cool fermentation process is used to develop the doughs' complex flavours and optimise digestibility and taste.

"As artisans we hand-form all of our bread, keeping mechanical process to a minimum," says Dance.

"The loaves are baked using stone hearths and radiated heat. Every ingredient and step in our artisan bread making process is focussed on upholding natural food integrity, flavour, nutritional value and digestibility."

Burleigh Baker uses its own natural leaven starters in its sourdough breads – one for traditional wheat-based sourdough, another for rye and spelt-based breads, and one for baguettes and pastry.

Although Burleigh Baker is less than 10 years old, Dance obtained the starters almost 25 years ago from a bakery in France. They are a combination of two naturally occurring organisms: a lactobacillus culture (one of the essential gut probiotics) and naturally occurring native yeasts.

The starter cultures are fed using organic flour and filtered water every 12 hours and are used continuously in the bread making process.

"These natural leavens are very sensitive to any

A CULTURED LIFE

Geoff Dance obtained the starters for the breads baked by Burleigh Baker almost 25 years ago from a bakery in France.

The leavens are a combination of two naturally occurring organisms: a culture like lactobacillus (one of the essential gut probiotics) and natural occurring native yeasts. These work in a symbiotic manner.

The probiotics digest the starches, and complex carbohydrates produce the natural preservative and flavour of lactic acid. This leaves sugars as an output, and the yeast then lives off the simpler sugars to produce the essential CO_2 or "bubbles" as we see contained in the dough. The glutens are then expanded by gas as the baker applies heat from the oven.

This effectively creates the infrastructure that holds the bread up and generates the crumb and crust.

"Our customers who have previously experienced gluten intolerance find that the fully fermented carbohydrates in our sourdough breads can be eaten without side effects," says Dance.

"This has allowed people who could previously not eat bread to enjoy its nutrition and flavour."

BEHIND THE BURLEIGH BAKER

Known affectionately as the Burleigh Baker, Geoff Dance grew up in Victoria and studied Agricultural Science at Longerenong in Horsham before graduating in Agricultural Economics at the University of New England (UNE) in Armidale, New South Wales.

He worked in consumer marketing in Australia and New York before moving back home to Australia, feeling the need to get back to his roots.

Dance then worked with a friend from UNE to build up one of Australia's largest, privately owned grain trading companies in Sydney, which was later sold to the Australian Barley Board. During this time, he worked with some of Australia's leading grain growers and exporters to preserve the integrity of Australian grain varieties and their regional characteristics.

After learning to make cheese, and recognising the same processes could be applied to bread making, he turned his back on retirement on the farm and jumped at the opportunity to begin a bakery to serve the community of Burleigh.

The Burleigh Baker was born. ■

inorganic contamination, in both the water and the flour," says Dance. "In other words, take the best ingredients possible, ensure they are free from contamination and additives, keep the mechanical processing to a minimum, allow time to ensure complete fermentation, promoting digestibility and to allow the leavens to complete their flavour development."

The dough undergoes 24 to 36 hours of slow, cool-temperature fermentation using strictly controlled and real-time monitored proving for three key variables: time, temperature and humidity.

This is where flavour development and digestibility are optimised and the natural leavens, which Dance refers to as "the good bugs", are allowed to do their work, converting flour into nutritious great tasting sourdough bread.

"The two most frequently asked questions by our customers are, 'Why does your bread taste so good?' and (from gluten-intolerant people) 'How is it I can eat your bread?'. The answers are flavour development, and digestibility."

Dance says making long, cool-fermented sourdough bread in sub-tropical southeast Queensland is a challenge given local humidity is often around 90–100 per cent, and temperatures range from 24–35˚C for nine months of the year.

"We sort of stumbled on longer fermentation times that effectively created better tasting and more digestible sourdough, because when we first started, sleep for the baker became paramount and was the major constraint.

"We needed the bread ready for when we had caught up on our sleep – not when today's outside temperature had control."

It was this need for sleep that led to a partnership being formed with Elite Refrigeration some eight years ago.

An industry leader in commercial refrigeration and air conditioning across Brisbane and the Gold Coast, Elite Refrigeration has developed a long-standing business partnership with Dance and the Burleigh Baker team over the years.

"We've provided 24/7 refrigeration repair, service and maintenance for a number of years, and delivered custom-designed solutions to ensure the refrigeration equipment Burleigh Baker relies on is always operating to optimal performance to meet business needs," says Nic Essex, M.AIRAH, director of Elite Refrigeration.

That early engagement saw Elite Refrigeration's lead installer, Jason Fisher, tasked with devising online control mechanisms for time, temperature and humidity. This led to a custom-designed solution being developed, which provides Dance with the ability to create 11 specialised fermentation rooms.

Temperature set-points of 2–55˚C, relative humidity from 5–95 per cent, and fan speeds can be controlled and varied remotely via wi-fi controllers, with fermentation times linked to temperature and humidity.

Where the magic happens – an upgraded bread fermentation room.

A BAKERY ON THE RISE

In mid-2022, Burleigh Baker again engaged Elite Refrigeration to increase the refrigeration capacity, and improve the energy performance of systems serving the company's Varsity Lakes bakehouse.

"Cognisant of rising energy prices, Burleigh Baker was looking to better manage operational costs with a reliable, future-proofed refrigeration system to advance business operations into the future," says Essex.

The scope of works included the construction of three new rooms to allow for the expansion of the business – a new freezer room, a new coolroom and a new bread slicing room.

Additionally, an existing freezer room and coolroom would be upgraded to operate on new energy-efficient refrigeration plant, and new equipment installed to operate an existing space as a bread and croissant cooling tunnel.

Dance worked closely with the Elite Refrigeration team on all facets of the project from design and establishing the project budget, through to risk mitigation and the selection of innovative solutions.

Close collaboration between client and contractor, together with the knowledge Elite Refrigeration had obtained about the bakery's fermentation and starter storage requirements, became critical as a short project deadline was set in order for the business to meet peak seasonal demand.

"This previous knowledge, experience and innovative attitude based on understanding the fermentation process and the storage requirements of the starters, paved the way for the design phase of the project and ensured accuracy in equipment selection to meet the project's requirements," says Elite Refrigeration's Project Manager, Daniel Bailey.

NEW SPACES

Work commenced at the Varsity Lakes bakehouse in early November 2022.

The new 14.4m^2 coolroom, 18m^2 freezer room, and 27.3m^2 bread slicing room were constructed by Passmores Insulated Panel Constructions within the bakehouse facility, while an existing space was converted to a bread cooling tunnel.

To serve these spaces, new refrigeration plant was selected based on energy efficiency and reliability.

The new coolroom and bread slicing room are served by a 12kW medium temperature system, while a 22kW medium temperature system serves the bread cooling tunnel and existing coolroom. Both refrigeration systems operate on R134a refrigerant, with a number of factors considered in its selection including equipment design efficiency, equipment availability and cost effectiveness.

The new and existing freezer rooms are served by a dedicated 12kW low-temperature freezer system operating on R404A refrigerant (see breakout).

Elite Refrigeration worked with Bitzer to carefully select and design each system, including the capability of capacity control via VSD (variable speed drive) or CRII.

"Through the design phase, we worked closely with Bitzer and Kirby to ensure engineering

PROJECT AT A GLANCE

THE PERSONNEL

- Client:
  Burleigh Baker
  Geoff Dance
- Refrigeration Contractor:
  Elite Refrigeration
  Nic Essex, M.AIRAH, Director
  Daniel Bailey, Project Manager
  Jason Fisher, Service Manager and Lead Installer
  Justin Ward, Installation Technician

THE EQUIPMENT

- Condensing units: **Bitzer**
- Evaporators: **Kirby**
- Coolrooms: **Passmores Insulated Panel Construction**

Source: www.burleighbaker.com

Jason Fisher and Daniel Bailey getting hands-on with the new condensing units.

of all equipment selected maximised energy savings and provided the project with quality refrigeration equipment," says Bailey.

"This solution has ensured the varying load requirements of the refrigeration and fermentation systems were managed effectively, and the energy-efficiency advantages offered by each system were maximised."

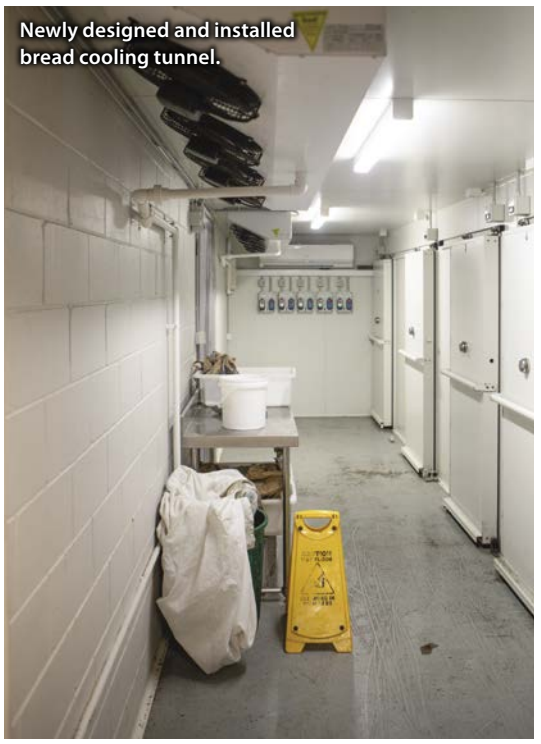
A number of specific functions also needed to be met, requiring systems to be versatile to suit the demands of the bakehouse on any given day.

For instance, the bread slicing room was designed to operate between 10–19˚C on a day-to-day basis to provide optimal bread slicing conditions.

But according to Elite Refrigeration's Jason Fisher, this room is also functionally versatile.

"As well as providing conditions to suit bread slicing, this room was designed with the capability to also operate as a fermentation room, achieved by using heating and humidity control equipment," he says.

"And beyond that, it is also able to operate at 2˚C to provide additional storage, thereby giving the bakehouse and business greater flexibility."


Newly designed and installed bread cooling tunnel.

A special coating was applied to all installed evaporators to ensure long-lasting and resilient corrosion protection.

All installation works were carried out while the bakehouse remained fully operational, with careful consideration given to ensure business operations were not affected.

Planned staging and scheduling of system shutdowns and changeover periods was done in close consultation with Dance and the Burleigh Baker team.

This required Elite Refrigeration's team to pay special attention to resource availability, and align this with the delivery timeline.

"Manufacturer and contractor expectations were also outlined and clearly communicated, allowing for the flexing of project scope and timelines while maintaining the required project delivery date," says Bailey.

READY FOR MORE

The project was completed in only six weeks, with all systems operational by mid-December 2022, in time for a significant increase in seasonal demand.

The new refrigeration plant and equipment was tested against high system capacity load requirements and has since fared well in the high ambient conditions experienced during a particularly hot Gold Coast summer.

"Geoff and the team at Burleigh Baker were able to increase production significantly," says Essex, "and December is always one of the busiest periods for the business."

Not only has the refrigeration equipment performed above and beyond expectations, but Burleigh Baker has seen energy bills reduce by 25 per cent while its refrigerated space has increased significantly.

According to Dance, the project has provided Burleigh Baker with the scope to continue to grow and improve.

"We now have been able to increase the production of the business and increase the quality of our products to an even greater level," he says.

"The team at Elite Refrigeration has been fantastic, and we have all worked together to innovate and create a very specific fermentation and refrigeration system that has benefited our business greatly."

REFRIGERANT SELECTION

The Elite Refrigeration team reviewed several options of refrigerants before settling on R134a for the medium-temperature systems and R404A for the low-temperature system at the Burleigh Baker's Varsity Lakes bakehouse.

Project Manager Daniel Bailey says that although they fully support the transition towards refrigerants with lower global warming potential (GWP), there are several considerations that are still proving a major factor.

"I try to guide clients towards low-GWP options," says Bailey, "but when your system refrigerant charge is 50–100kg and the cost difference is as much as $50 more per kilo, it's a major disincentive."

Bailey also notes that that currently the Australian supplier market does not readily stock the necessary ancillaries to support the new generation of refrigerants, for example, mechanical TX valves.

"Why are we being advised to install new equipment stamped with R404A, but then advised to use an alternative next-generation refrigerant to charge the system and commission accordingly?" says Bailey. "We need to change the mindset."

The situation is even more difficult, Bailey says, when dealing with first-time clients. In these situations, there is no opportunity to educate clients about refrigerant gases and the HFC phase-down. Rather, when there are several tenders on the table, the client generally focuses on the lowest first cost.

"As a business we also must remain competitive in the market," Bailey says.

"Is everyone in the industry future proofing when designing systems to ensure adequate capacity capability allowances of the system is available at the time of future retrofitting new generation refrigerants? If we are really going to transition, something needs to be done about the price and ensuring that all the necessary equipment is available in the market.

"Further attention is also required to providing industry education. Clear direction with a detailed transition pathway which incentivises the industry is key."

ENERGY EFFICIENCY

According to Elite Refrigeration Director Nic Essex, M.AIRAH, Burleigh Bakery owner Geoff Dance had energy efficiency as a high impact item for the project.

"Monitoring and reducing energy costs is critical to Burleigh Baker's business operations," says Essex, "and the refrigeration plant and equipment represents a high percentage of the energy costs incurred by the business."