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Beca
Food & Beverage

Feedback


Rob Ross // New Zealand


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Editorial

Businesses around the globe have had a particularly tough two years. While the Food and Beverage industry traditionally weathers recessions well, many of our clients have combined strategic capital investment with current trends in energy and plant efficiency improvements aiming to enhance their competitiveness for the long haul.

Beca had the opportunity to work on several recent projects locally and internationally with global Food and Beverage clients who are embracing green technology. As well as our expertise in this area, Beca's Food and Beverage team can draw on the wide range of knowledge and experience across the Beca group to get quality inputs in almost every aspect of engineering as well as project and cost management on our national and international projects. From our clients' perspective, the relative ease and speed of getting all this information is often very cost effective compared to seeking advice (and briefing) a range of consultants for the same project.

In this issue, we highlight some examples where we have been able to offer our clients a "One Stop Shop" across a wide range of engineering knowledge and current trends including energy and plant efficiency improvements.

First brew at new, sustainability-focused facility

A critical milestone for Lion Nathan was celebrated with the 'first brew' in September 2009 at The Pride, their new NZ$250 million, world-class alcoholic beverage manufacturing and warehousing facility in South Auckland.

"Teamwork has been critical to the success of this project," says Sue Bradley, Beca's project manager. "Beca, main contractor Mainzeal, process equipment supplier Krones AG, and other key subcontractors have worked closely together to meet tight deadlines and budget, and in developing creative solutions to back up the client's commitment to sustainability."

As well as reducing overall operating costs and improving product quality, Lion Nathan's objectives were to increase environmental performance, particularly in energy and water efficiency, improve the working environment for staff through incorporating ecologically sustainable design features, and include health, safety and environmental considerations into the design and construction processes.

The latest processing and packaging equipment has been installed to reduce energy and water usage, and sustainable and innovative features were a focus of the building design, such as using recycled crushed glass in concrete, a lightweight steel structure, and native plantings, wetlands, and other ESD features.

As Lion Nathan gradually moves all operations from the existing sites to the new site by 2011 the true impact of their commitment to sustainability will become evident, along with further energy and water savings. After more than 100 years of brewing at the Newmarket site, The Pride is taking Lion Nathan well and truly into the 21st century, and cements its position among the world's best.

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Tropical paradise enhanced with new brew

In 2008, APB through Heineken commissioned Beca to develop a 5-year Masterplan to support a capital works programme for SP Brewery in Papua New Guinea. Beca worked closely with the SP Brewery and Heineken teams to develop, negotiate and award major international vendor contracts for the brewhouse, canning line, tank supply, refrigeration plant and bottling lines.

In addition, Beca was awarded the first stage of an AUD$50M capital works programme across SP Brewery's Port Moresby and Lae sites. The Beca team named this initial phase Project Paradise, after the Papua New Guinea bird of paradise. Project Paradise was delivered on programme and within budget and the second phase is awaiting approval to proceed.

A key milestone was achieved when the new Brewhouse at Lae was commissioned in November 2009. This was recognised at an SP Board meeting where Beca was awarded a commemorative "First Brew" plaque.

Beca has worked successfully with a range of food and beverage clients in conjunction with local organisations in the wider Asia-Pacific region. One of the key success factors and more challenging aspects of working in Papua New Guinea was the Beca team's ability to manage the installation programme and coordination of the interface between international vendors and local construction companies.

Revamping a national distribution centre for growth

Progressive Enterprises' NZ $18 million revamp of its Auckland National Distribution Centre is setting the stage for future expansion, in line with its national logistics strategy.

The rebuild will completely change the structure and operation of the distribution centre, which will cater largely for slow moving products destined for its stores nationwide. The facility will house 8000 different SKUs, with around 5,000 pallets moving into and out every week.
The upgrade also paves the way for future development on the remainder of the site.

Key features include an enlarged site entrance, a new truck route alignment and a canopy on the eastern side of the facility, with 60m clear span.

Beca's Innovative engineering on the canopy has provided one of the largest industrial roof clear spans in New Zealand, as well as meeting the geometric requirements for truck movement and access into the main Distribution Centre. Existing redundant structures will be demolished, making way for a new administration building. The interior will be completely gutted, with internal and truss modifications and 1200 tons of modern racking installed in a new alignment.

Beca is providing a comprehensive range of services including project management, LEED (leadership in energy and environmental design), architecture, structural engineering, civil engineering and building services. According to Project Manager Scott Logie, phased construction has helped to ease in the new extended warehouse area. The contract works were competitively tendered on full design documentation which has resulted in excellent financial benefit for Progressive.

Scott believes the project's smooth progress is largely due to a collaborative culture and open and transparent communication processes between all project parties, who are able to share a web based 'Project Centre', TeamView. Beca's 'TeamView' enables all project communication and documentation to be stored in one easily accessible place, avoiding 'long email strings' and potential delays or confusion in accessing the most recent project documents.

A key project driver is safety. Progressive has a 'Destination Zero' safety culture across the organisation, aiming for zero tolerance to unsafe acts and conditions and zero injuries. This culture has been widely entrenched on site and will continue to drive behaviour for the duration of the project, which is due for completion in February 2011. So far, there have been no LTI's or medical treatment injuries on the project.

◀ Current facility

◀ Impression of the revamped facility

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Offering our clients a 'one stop shop'

Our food and beverage clients are often appreciative of the breadth and depth of skills and resources available to them when dealing with Beca.

Frucor Beverages Ltd is one such client. While previously aware of our experience in advising on food and beverage projects, the company has discovered over the last few years that Beca is able to provide a comprehensive package of services across several disciplines.

These services have included developing master plans for a planned new manufacturing plant and a new Can Line plant, where Beca prepared scope, layout and cost estimates to support Capex approval. We have also provided structural engineering, architectural, building services and consent planning for various building upgrade works. Beca's experienced project managers have stepped in to assist in project managing and delivering these works, complementing Frucor's existing site team, as required.

Beca has also undertaken energy studies for our food and beverage clients, providing options for 'quick fixes' to help yield savings in operational costs and reduce energy losses (see Managing Energy Use article).

Hansells Group is another client who has taken advantage of the breadth of Beca's resources. The company is currently building a new process plant at its Rockfield Road site in Auckland. While retaining overall control of the project management and procurement aspects of the job, Hansells Group has been using Beca to complement its own resources with additional engineering and contract administration support.

Beca's services for food and beverage projects focus around the core capability of plant development and installation, including building design and construction management. During these projects there is often a need for advice on related disciplines such as fire protection, geotechnical or environmental.

Beca's food and beverage team can quickly access and brief our engineers to provide this advice to address the client's requirements.

For further information on the wide range of services available to our clients please visit **www.beca.com** or contact Jorge Martinez (New Zealand) or Phil Card (Australia).

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New wastewater treatment plant for year-round disposal

Fonterra's Kauri factory generates up to 3600 m³ of wastewater every day. The factory has a dissolved air flotation plant as primary treatment to remove fats and grease before the effluent is irrigated onto farmlands.

At times it is impractical to irrigate, such as when there is high soil moisture content or when extreme weather events cause surface flooding of the paddocks.

To provide all year round, robust wastewater treatment and disposal, Fonterra is installing a biological wastewater treatment plant (WWTP), which will operate when irrigation is not possible. This plant is planned to produce a treatment effluent quality suitable for discharge into the local river.

Fonterra and Beca have combined their WWTP knowledge to establish the plant operating requirements. To protect the river quality in the receiving environment, the treatment plant will discharge to the river only when the flow rate in the river exceeds the minimum flow rate requirements. The flexible operation of the plant will also help to reduce the power consumption for aeration when irrigation is possible.

The plant will operate with an activated sludge process incorporating an anoxic zone for nitrogen removal. The aeration basin will be constructed as a lined earth pond, with oxygen requirements being provided with the use of floating surface aerators. Waste biomass produced by the process will be dewatered using a decanter to minimize the amount of solids being irrigated. The collected biomass will be composted off site.

Beca provided concept and detailed design for the plant and prepared tender documentation. Beca is now project managing the implementation by three main contractors, who are providing construction and key equipment installation for the pond and related facilities.

Construction started in January 2010, and the project is scheduled for completion in October 2010.

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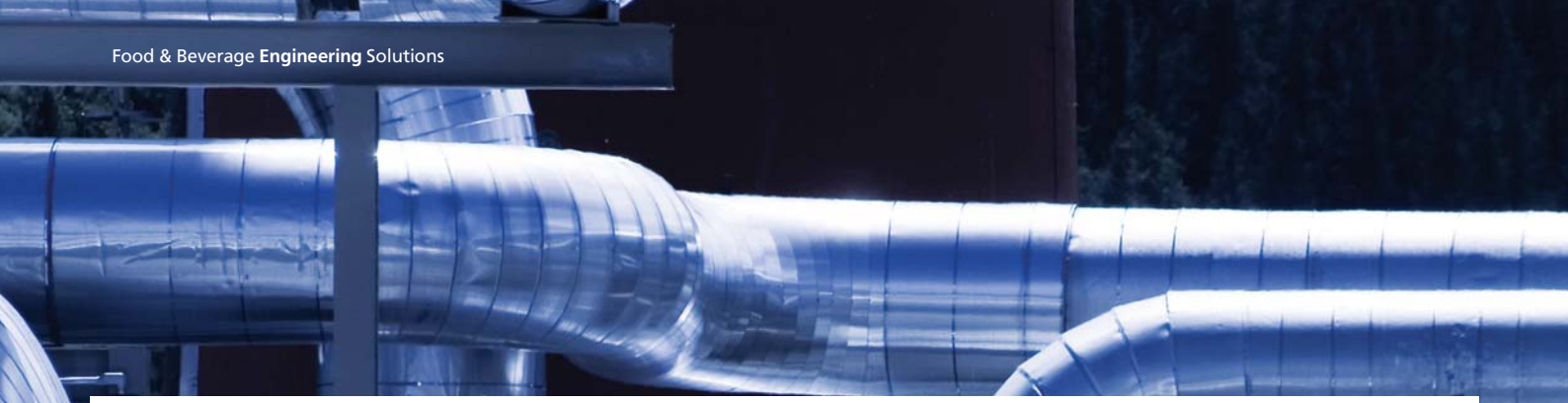

Managing energy use in food and beverage plants

With energy costs escalating, reducing energy use makes good business and environmental sense. Energy management plays a key role in any sustainability strategy and initiatives to reduce energy use fall into two broad categories - operational and technical.

Improvements to operational energy use should include addressing equipment use during non-productive times. For example, the design of refrigeration equipment is often based on peak load requirements. However, the reality is that refrigeration often operates part-loaded which means this is a key area where energy reduction can be effectively achieved.

The back bone of an energy management plan is a structured audit process which begins with a review of current energy and utility usage benchmarked against current best practice targets. Further detailed auditing enables effective monitoring and targeting by establishing benchmarks for individual departments, machines or processes.

For example, a dairy factory was recently audited and its energy usage was found to be 1.8 times higher than current benchmarks; 54% of usage related to operational factors and 46% to technology factors.

A structured approach to auditing can place a spotlight on poorly performing areas. Tools such as dynamic modelling can be applied to develop initiatives for energy reduction.

Beca has successfully completed a number of audits for our clients in the diary, meat processing and building services areas. We would welcome the opportunity to assist you with benchmarking energy usage in your plant as well as developing initiatives to help improve it.

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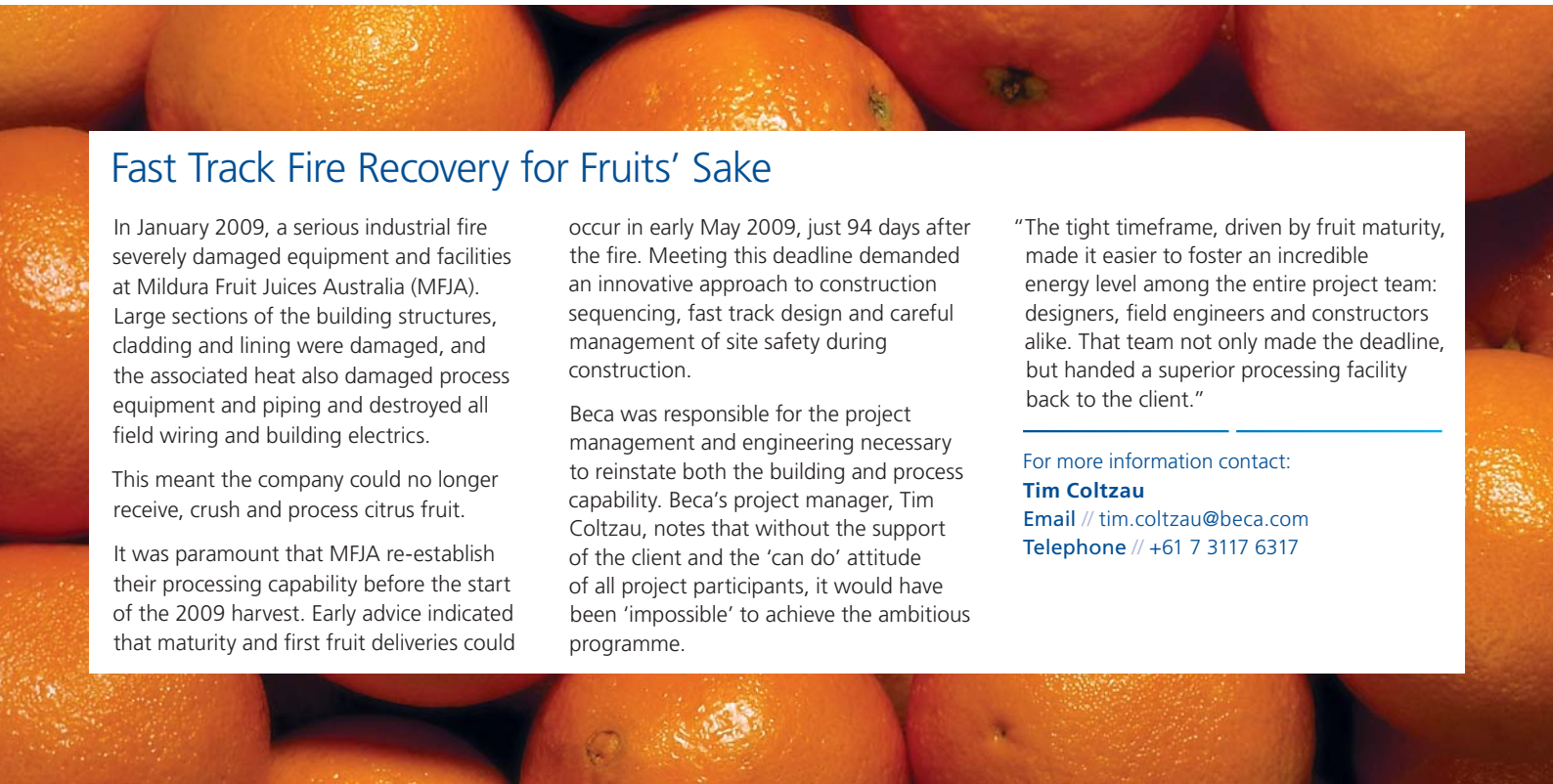

Fast Track Fire Recovery for Fruits' Sake

In January 2009, a serious industrial fire severely damaged equipment and facilities at Mildura Fruit Juices Australia (MFJA). Large sections of the building structures, cladding and lining were damaged, and the associated heat also damaged process equipment and piping and destroyed all field wiring and building electrics.

This meant the company could no longer receive, crush and process citrus fruit.

It was paramount that MFJA re-establish their processing capability before the start of the 2009 harvest. Early advice indicated that maturity and first fruit deliveries could occur in early May 2009, just 94 days after the fire. Meeting this deadline demanded an innovative approach to construction sequencing, fast track design and careful management of site safety during construction.

Beca was responsible for the project management and engineering necessary to reinstate both the building and process capability. Beca's project manager, Tim Coltzau, notes that without the support of the client and the 'can do' attitude of all project participants, it would have been 'impossible' to achieve the ambitious programme.

"The tight timeframe, driven by fruit maturity, made it easier to foster an incredible energy level among the entire project team: designers, field engineers and constructors alike. That team not only made the deadline, but handed a superior processing facility back to the client."

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New faces

Adrian Dickison

A Senior Chemical Engineer, Adrian has been with the Beca group since 2004. Based in our Auckland office, Adrian offers a wealth of experience in the light industrial, oil, gas, forestry and mining sectors, in New Zealand and internatonally. His fluency in French was particularly valuable in a number of large projects in New Caledonia, including two large off-gas cleaning projects. With additional experience in the chemical and pharmaceutical industries, Adrian specialises in process design and refrigeration systems. He is also skilled in HAZOP facilitation.

He is currently involved in a number of projects for Fonterra developing dynamic models and identifying energy and plant efficiency improvements. Adrian's role within the food and beverage team is to provide simulation and dynamic modelling capability for production and energy related plant.

Sarah Southwell

Sarah is a Senior Process Engineer with a range of process design and project implementation experience in the food and beverage industry in Australia and New Zealand. She joins us from the Beca office in Melbourne, where she was recently involved in the design of a number of major water treatment plants. Over the last seven years she has provided process design and technical support on projects for clients such as Kraft Foods, Sugar Australia, Coca Cola, Southcorp Wines and Fonterra.

Her new role in Beca will be as a project manager with process lead requirements, based in the Auckland Office.

Peter Shannon

Peter recently joined Beca in the Hamilton office after returning from England. His background in materials handling, manufacture and project management makes him a valuable addition to the food and beverage team. In the UK, Peter worked for laundry equipment suppliers Kannegiesser UK, where he was involved in the design and management of a suspended gravity driven monorail sorting and storage system for delivering laundry from inward goods to tunnel washers. He has also done work for Compac Sorting on the mechanical design of conveyors used in grading fresh produce.

His current role is as a mechanical process engineer, and he is presently working on a number of projects for Fonterra.

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