

## Sustainability at Fonterra

As the Institution of Professional Engineers of New Zealand celebrates its centennial year during 2014, it has been showcasing some great engineering that we kiwis can be proud of. I should not have been surprised at what I was about to hear when recently attending a talk given by engineers involved in the construction of Fonterra's new milk powder plant at Darfield.



Darfield site during construction      Courtesy - Fonterra Co-Operative Group

Drying milk into powder is an energy intensive activity and Fonterra has incorporated considerable effort into how to save energy in every phase of its business - planning, construction and operation over the expected 30 year life of the plant. Decision making has been around considering the total cost of ownership over the plant life, rather than just considering the initial purchase price. For example LED lighting has replaced metal halide lighting at Darfield resulting in a 30% saving in cost through longer life and higher efficiency.

The siting of the new plant involved optimising the transportation of milk from dairy farms to the manufacturing facility and finished product out to the port and to export markets. Annually Fonterra recycles 20 tonnes of tyres from its large milk tanker fleet. Also on-going consultation with neighbours and the community formed an integral part of planning and construction at Darfield. The site was deliberately moved over a kilometer away from the highway to reduce noise and other impacts.

Darfield's first drier produces 85,000 metric tonnes of powder a year or roughly 5,000 20 foot containers which are sent by rail to the port. Recently the world's largest and most efficient drier (30 metric tonnes per hour and twice the size of its first drier) was commissioned at Darfield. These driers along with the process make extensive use of heat recovery loops to minimise energy use and maximise water recycling and re-use. Fonterra reports that their manufacturing operations carbon footprint has reduced from 0.64 to 0.63 tonnes CO<sup>2</sup> emitted per tonne product over the previous year.

In August 2012 a contractor died when he fell from the platform at the Soprole operation in Chile. On 28 November 2013 a chlorine leak at the Fonterra Clondeboyne plant near Timaru caused a partial evacuation of the site with loss of production with 7 staff hospitalised. In response Fonterra wanted a step change in health and safety performance including during construction of the Darfield plant.



The 'Putting People before the Project' principle employed during the \$500 million construction projects at Darfield has resulted in a significant culture change not only with Fonterra project staff but also within the contractor community working on site. The total injury frequency rate (TRIFR) for the Darfield project was 55% lower than the previous construction project. Fonterra won the ACC 'Best Leadership of an industry award' at the 2013 New Zealand Workplace Health and Safety Awards. Currently the learning from Darfield is being applied at the Pahiataua expansion project where a new high efficiency powder plant is being constructed.

Fonterra's sustainability approaches at Darfield include considering the needs of stakeholders in the siting and construction of its plant, whole of life considerations during design, energy and water use and the treatment of waste during operation, and the health and well-being of people.

For me this presentation was a case study on business sustainability. Fonterra had taken a holistic approach to managing their business which included risk, quality, health and safety, social responsibility and the environment. They have clearly gone beyond compliance and through their continuous improvement efforts will no doubt receive many more awards in the years to come. Many thanks to those at Fonterra for sharing this project to a small group of engineers.

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