Sound environmental management is good business

CAWTHRON MARLBOROUGH ENVIRONMENT AWARDS 2021

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JUDGES' REPORT

FORESTRY

ONEFORTYONE KAITUNA SAWMILL

INTERVIEWED Kristie Paki Paki and Bryan Phillips

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JUDGES Rick Osborne, Penny Wardle, Ket Bradshaw

INTRODUCTION

Kaituna Sawmill is leading the way with the measurement and management of its carbon footprint. In the past 10 years the sawmill has achieved a 46% reduction in the site's greenhouse gas emissions.

A suite of environmental improvements has been made, from small to significant. A state-of-the-art Biomass Energy Centre and continuous drying kiln installed in 2016 has reduced the sawmill's carbon footprint by 934 tonnes of carbon dioxide equivalents per year.

Australia-based OneFortyOne purchased Nelson Forests (including Kaituna Sawmill) in 2018. The now Australasian company is committed to sound environmental management and has a policy of continuous improvement.

Staff are proud of what the mill is achieving and keen to do more. They are also working to build the business's reputation in the community through open days, sponsorships and publicity.

GENERAL INFORMATION

Kaituna Sawmill near Renwick processes pruned logs into high quality timber products for New Zealand and export markets. Eighty percent of their wood is sourced from Forest Stewardship Council-certified sustainable forests. The remainder comes from other sustainably-managed properties.

A large portion of forest in New Zealand is exported as logs with little onshore processing. The Kaituna sawmill is a notable exception, adding value and creating jobs.

In 2009 a Master's student developed a carbon calculator used to measure greenhouse gas emissions from Nelson Forests' operations, from plantations through to markets in New Zealand and overseas. This identified areas of the milling process where emissions could be significantly reduced.

In response to this analysis, an inefficient kiln fuelled by waste oil and trucked-in wood pellets was retired. In 2016 the company invested $8 million in a highly efficient Polytechnik Biomass Energy Centre and a Windsor continuous drying system. This new technology burns wet sawdust and shavings, reducing waste and producing more energy with lower emissions.

This has both environmental and commercial benefits. The new clean-burning technology has reduced air particle discharges by two-thirds and the continuous drying system has led to energy savings of 30 percent. (Under the old system the wood was left in the kiln to cool down and then the kiln had to be reheated for the next batch of wood).

The carbon calculator has been adopted as a permanent tool by the company to track improvements over time.

An environmental improvement committee chaired by environmental planner Kristie Paki Paki meets every two months to review systems and discuss and follow up on any incidents. Committee membership includes Marlborough District Council monitoring staff.

Eighty five percent of sawmill staff have completed an environmental unit standard which is part of training for new employees, exceeding the company's 80 percent target.

PROBLEMS AND HOW THEY HAVE BEEN TACKLED

- *Climate change:* CO^2 in Earth's atmosphere reached record levels in 2020. Kaituna Sawmill started measuring its carbon footprint more than 10 years ago, after identifying opportunities to reduce greenhouse gas emissions by 16-25% across log and lumber supply chains. It calculated that emissions associated with the generation of thermal energy to heat kilns accounted for up to 85% of total processing emissions at the sawmill. The carbon calculator was integrated into the business for ongoing measurement and management of the carbon footprint. The change to the Biomass Energy Centre and continuous drying kilns reduced its carbon footprint by 934 tonnes of carbon dioxide equivalent. As a comparison that equals 198 cars driven for a year or 120,517,950 cell phone charges. Other benefits include:
    - $500,000 saving in fuel costs;
    - Reduction in waste products;

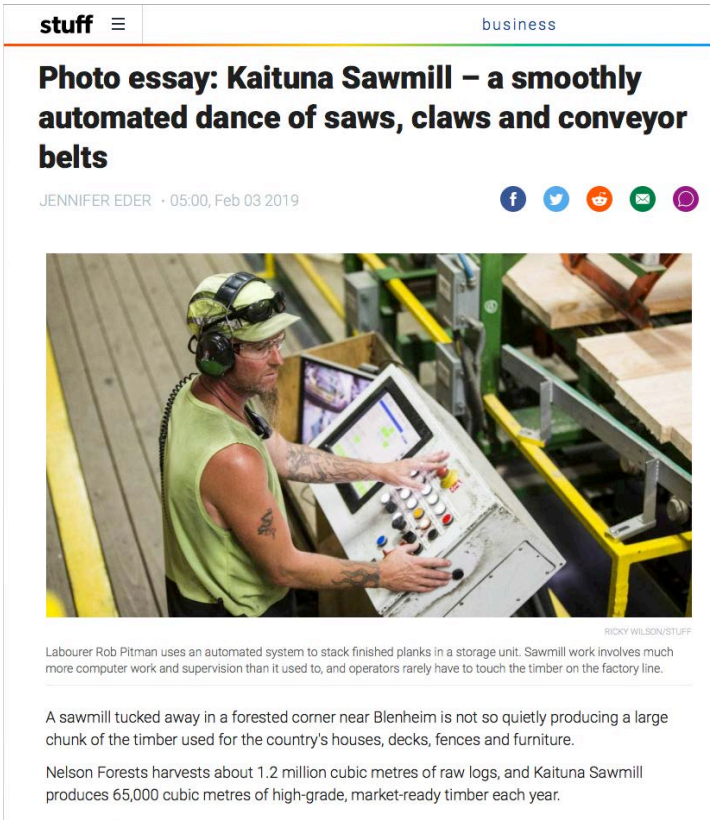
- Reduction in emissions of particulate matter (PM), which can damage heart and lungs, from 300mg/m^3 to 100mg/$m^{3;}$
- Increased production, capacity and quality;
- It is no longer necessary to bring in dried fuel from other sources.

The sawmill manufactures value-added timber which has a typically long life in buildings and other structures, extending the storage-life of carbon. Domestic processing saves energy and carbon emissions from shipping logs and timber overseas. Approximately 60% of timber is sold in New Zealand and 40% exported, with a focus on Australian and Asian markets.

- *High moisture content of radiata pine wood:* Sawdust from radiata pine contains about 120-130% moisture. The boiler originally used to dry lumber at Kaituna Sawmill required sawdust with a moisture content no greater than 15%, to create enough heat to dry timber. The second boiler ran on waste oil, and trucked-in wood pellets were needed to dry sawdust to 15%. The Biomass Energy Centre directly burns wet ("green") sawdust and shavings.

- *Efficiency:* The Energy Centre and continuous drying kilns have significantly improved efficiency in the following ways:
  - Heat from the boiler is reticulated through the kilns. Sawn timber flows through slowly on two tracks moving in opposite directions. Waste heat from the dry timber on one track preheats green timber on the other, reducing the energy required for drying. Steam emitted from the green timber is pumped to the dry timber, lifting its moisture content to 30%. This reconditioning removes internal stress so it can be processed without damage.
  - The plant can be remotely monitored and problems identified by Polytechnik staff in Europe. Automatic control systems maintain a balance between heat demand and combustion, providing optimal conditions to maximise efficiency and minimise emissions.
  - An Economiser heat exchange unit at the Energy Centre captures heat from flue gases, raising the temperature of water from about 90°C to 130-140°C before it goes to the boiler. There is an automatic system for cleaning tubes of potential build-up of ash from flue gases using a blast of compressed air. The Energy Centre runs so efficiently that ash from the boiler can be cleared every three weeks, when previously this was every three days.
  - Water extracted from the Wairau aquifer has been reduced from 50-70m^3/day to 30-40m^3, since the new boiler was installed. Water is for staff use, lubricating saws, treating timber and occasional dust suppression.

- *Environmental contamination:* A stormwater system carries run-off from a recently sealed site to a settling pond where dust, sawdust and shavings settle. Sealing reduced the area of gravel and subsequently the volume of dust released into the air and settling pond. A flocculant chemical is used to remove "fines" from the pond then water is discharged through an extensive piping filtration system into the forest behind the mill. Monthly testing of soil in the discharge area shows contaminants (CCA) well below consented limits.
- *Waste minimisation/utilisation:* The sawmill is reducing and reusing waste streams in several ways:
    - Computer and laser technology maximises timber yield from various sizes of log, with minimal waste.
    - Waste streams of sawdust, bark and ash are managed as a resource. Sawdust fuels the kiln boilers. Bark, yard sweepings and ash is sold or given away to a landscaping company for use as mulch and in playgrounds. Woodchips are sold for use in MDF board and to a company that uses them to filter water.
    - About 30% of the wood that goes through the sawmill is treated with copper chromium arsenic, when ground durability is required. Previously this timber was dressed following treatment, so any waste shavings and sawdust had to go to landfill. Now dressing is done prior to treatment, and any waste wood can be used to feed the heat plant.
    - About 10% of woodchip is sold for producing heat for glasshouses near Blenheim, which cut fuel costs by 21% by switching to bio-fuel. A wine company buys 5-10% for use in a bio-filtration trial and demand could increase if this is successful. The remainder is trucked to Rangiora (as a backload) and Nelson to produce MDF.
- *Community responsibility:* Some people see the steam column rising above the Kaituna Sawmill and assume it is bad for the environment. The company works to raise awareness by:
    - Embracing publicity with a photo-feature on Stuff profiling the Kaituna mill and an article in the NZ Logger magazine.
    - Holding regular neighbours' days hosting up to 40 people including suppliers and Marlborough District Council staff who can help answer questions.



stuff ☰ business

Photo essay: Kaituna Sawmill – a smoothly automated dance of saws, claws and conveyor belts

JENNIFER EDER · 05:00, Feb 03 2019

RICKY WILSON/STUFF

Labourer Rob Pitman uses an automated system to stack finished planks in a storage unit. Sawmill work involves much more computer work and supervision than it used to, and operators rarely have to touch the timber on the factory line.

A sawmill tucked away in a forested corner near Blenheim is not so quietly producing a large chunk of the timber used for the country's houses, decks, fences and furniture.

Nelson Forests harvests about 1.2 million cubic metres of raw logs, and Kaituna Sawmill produces 65,000 cubic metres of high-grade, market-ready timber each year.

- Donating timber to build a veranda on an accommodation building at the Pine Valley school camp and providing bark for the playground. More timber has been offered to build a boardwalk over a wetland.
- Participating in the Marlborough District Council-run catchment group for the Are Are Stream and helping with riparian native plantings.
- The mill offers training for school-leavers in a variety of trades.

- *Biodiversity threats:* Kristie contributes to the iNaturalist website and app – a joint initiative of the California Academy of Sciences and National Geographic Society. She maintains a species field guide to help colleagues and contractors identify endangered indigenous flora and fauna including kārearea, adding observations that are shared around the world. GPS locations are added automatically, photos can be uploaded and expert help requested.

SUMMARY

OneFortyOne recognises the importance of the Kaituna Sawmill having a social licence to operate. The company has made significant changes to meet environmental and social responsibilities and has picked up the challenge of continuous improvement.

Their operational improvements have caught the attention of the wider industry and the sawmill is seen as an innovator and leader.

The judges were impressed with OneFortyOne's policy of continuous improvement and the genuine desire to minimise the operation's carbon footprint to make an environmental and economic contribution to Marlborough.

SUGGESTIONS

- Keep sharing achievements, linking what's happening at the mill with what's happening in the forests (chain of custody). Maintain media presence and public profile.
- Help Marlborough towards Green Energy by continuing efforts to grow the market for biofuel/biofiltration/bio-compost. The wood chip by-product currently trucked to Nelson and Christchurch could enable change for Marlborough operations currently burning fossil fuels, e.g. the hospital, greenhouses.
- Consider modifying Bryan's job title from "compliance" to "sustainability" to better reflect the company's proactive and positive attitude to meeting and exceeding environmental standards.
- Continue with plans to expand the mill to increase local manufacturing.
- Investigate electrification of the vehicle fleet to achieve further emissions reductions.