



## Project Review

### Red Stag Timber, Boiler 3 - Rotorua, New Zealand

#### 10MW<sub>th</sub> Biomass Fired Boiler

Client: Red Stag Timber  
 Location: Rotorua, Bay of Plenty, New Zealand  
 Duration: 16 months Design and Build

#### Background

Almost half of New Zealand's plantation wood is harvested from central North Island forests within 100km of Rotorua. Located at the heart of this region, Red Stag Timber's Waipa sawmill is the largest mill in New Zealand producing structural timber for the residential housing market.

Red Stag Timber currently processes over a million tonnes of radiata pine and Douglas fir logs each year, earning it industry recognition as a "super mill".

Production on this scale requires large amounts of energy; the electricity alone is equivalent to the consumption of a town of about 19,000 people. In addition, timber treatment and drying processes involve heat energy in the form of steam.

Much of the site's energy demand was already supplied from two biomass boilers fired by the plant's own woodwaste, producing superheated steam for a turbine generator, and low pressure steam for process heat. The original turbine, installed

in the 1980s as part of a state-owned initiative, had served the plant well, but increased timber production from a recent sawmill upgrade had led to a corresponding increase in energy demand. Along with this was an increase in available woodwaste. Clearly it was time for a second turbine and a third boiler.

#### The Solution

After evaluation of the plant's energy requirements and the available technologies, Red Stag Timber awarded the contract for a 13t/hr (10MW) superheated steam boiler in August 2016.

The contract scope consisted of the design and build of the complete boiler plant, integrating it with the existing plant and equipment on the site:

- Steam boiler plant including integral ancillaries;
- Motor Control Centre;

- Electrical instrumentation and control (EI&C) systems.
- Combustion air and flue gas systems including fans and ducting;
- Fuel metering and delivery system;
- Feedwater pumping and piping system;
- Steam, water and condensate piping systems;
- Multicyclone particulate emission control system;
- Ash handling system;

With integration of this boiler, the site now generates all its process steam requirements, and is largely self-sufficient in electricity. It is only necessary to import power to cover peak weekday loads, but outside of these times and throughout the weekends the co-generation plant has surplus capacity to sell electricity back to the national grid.





## Why Windsor Energy?

As a trusted provider of energy plant and services in New Zealand and Australia, Windsor Energy offered the following advantages:

- Extensive installed base of heat plants in the timber industry and for other large industrial clients.
- Project team experienced in the practical details of firing the nominated fuel blend of green sawdust and dry shavings.
- Babcock & Wilcox Towerpak® boiler design, with proven water-cooled reciprocating tile grate for excellent durability and maintainability.
- Modular plant package, optimised for long-distance transport of components, and efficient, safe assembly at destination.
- Innovative plant design for high efficiency, simple operation, high availability and low overall cost of ownership.

Project Name	Red Stag Timber Boiler 3
Project Number	2948
Date Installed	2018
Boiler Type	B&W Towerpak® Boiler
Combustion System	Air swept spreaders firing onto water cooled reciprocating grate
Thermal Capacity	10 MW
Fuel Source	Woodwaste (Sawdust and shavings blend)
Boiler Design Code	AS 1228
Steam Output	13,000 kg/h
Steam Temperature	400°C
Design Pressure	5,450 kPa
Operating Pressure	4,240 kPa
Feedwater Temperature	105°C
Emissions Guarantee	< 200 mg/Nm <sup>3</sup>
Particulates	
Turn Down	3:1

## Contact Us

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