# A change for the better at Ross Home – converting from LPG to wood chip

With escalating heating costs, the management team at Ross Home was motivated to make savings to ensure it could continue to deliver excellent care to residents. With over 120 beds and a need to heat the Dunedin facility 24 hours a day, seven days a week, it made financial sense to replace the existing LPG boiler with an economical wood chip alternative.

## Providing quality care for the elderly of Otago

Established in 1918, Ross Home is the largest of seven care facilities for the elderly operated by Presbyterian Support in Otago. The home offers a comprehensive range of services, including independent cottages, rest home care in single rooms and self-contained units, and general and psycho-geriatric hospital care.

The ability to heat the facility round-the-clock and have a constant supply of hot water is paramount to the efficient day-to-day running of the home.

## Escalating fuel costs necessitated change

Property Manager for Presbyterian Support in Otago, Annie Robinson, said, "The price of LPG had been increasing every year and our monthly bills were astronomical. We decided to ask Beca to undertake an energy study to look at ways of saving money. They found that the single biggest cost was the heating and hot water."

Beca recommended converting from LPG to wood chip fuel and suggested Spark Energy as the main contractor.

Fuel storage bunker and spreader at Ross Home

## How it works

The new wood chip boiler is a 300kW Pyrot 300 round combustion chamber with moving grate system, made by the KÖB Viessmann Group. The maximum boiler temperature is 95°C with a continuous heat output of 270kW.

The boiler provides hot water via the low temperature hot water (LTHW) primary circuit to the accumulator tank.

The heat from the 2000L custom-made accumulator tank is transferred to the domestic hot water calorifiers via LTHW pipe work. A heat meter measures the energy usage, and Spark Energy was able to use the existing pipe work and radiators from the LPG system.

The wood chip fuel is supplied by H A Foote Haulage on the recommendation of Spark Energy. The haulage company receives waste wood from forests near Milton and Dunedin.

## Installation

The installation of the boiler, including construction of a new boiler house, took around 8 weeks. There were some minor delays caused by wet weather and flooding. The heat meter's temperature probe was wired incorrectly which led to false information being collected from the meter unit, although this was quickly rectified.

## Challenges encountered

The cost of the project was 18% over budget because the fuel transfer system and bunker construction exceeded estimates. A sprinkler system, which was needed in the fuel bunker, was not in the original estimate. From an operational viewpoint there were teething problems, but these were easily resolved when the Austrian boiler maker sent a technician to fine tune the equipment.

### ✓ Key features

- Pyrot 300kW wood chip boiler
- 2,000L hot water accumulator tank
- Storage of wood chips on site in 24 $m^3$ bunker
- Internet video camera in wood chip bunker connected to supplier's office ensures fuel is delivered at the optimum time
- Installation time, 6-8 weeks

### ✓ Key benefits

- In first month of operation the wood chip boiler saved $10,000
- Estimated payback period of 3 years
- Reduction of carbon emissions by 652 tonnes per year
- Wood chip supplied from plentiful and local source

### ✓ Sector relevance

- Hospitals
- Rest homes

## Conversion results

In the first full month of the new boiler working at Ross Home, the savings were approximately $10,000. The actual saving in September and October 2010 together was 32% compared to the LPG boiler used in the same period in 2009. Based on these figures, AirComm Consultants (monitoring report authors), has estimated the payback for the project at approximately three years. The maintenance cost is included in the delivered wood cost.

The total LPG usage for Ross Home in 2009 was 3,219MWh, including laundry and kitchen use. It is assumed that the wood chip boiler can replace 80% of the total LPG usage annually; thus the total heating energy produced by the wood boiler is assumed to be 2,575MWh. As a result of this project, carbon dioxide emissions have been reduced by 652 tonnes per year.

The boiler at Ross Home


Horizontal auger

## Do your homework

Property Manager Annie Robinson commented "Commissioning the energy savings study was the start of the process. Before committing to the project, Spark Energy arranged for us to visit other local sites which had installed wood chip boilers so that we could ask questions about their operations. We learned through one local school the importance of the on-going contract with Spark Energy and we were therefore able to negotiate a good deal on the wood chip fuel. We specified that we wanted to pay for the energy we used and not for the amount of wood chip delivered. This means we don't over pay if the moisture content of the wood is high."

## Ross Home perspective

"The manager at Ross Home was sceptical about changing the boiler. However, the forecast cost savings and the partial EECA grant, meant we literally couldn't afford not to invest in the system. The management team is delighted with the conversion. The whole project has been hugely successful. The wood chip boiler offers fantastic cost savings, low running costs, is operationally easy to run and maintain and has the added bonus of being environmentally friendly." said Annie Robinson, Presbyterian Support Otago.

## Key personnel

Annie Robinson, Property Manager, Presbyterian Support Otago (Ross Home), (03) 477 7115.

Spark Energy (main supplier for project), (03) 441 8079.

H A Foote Haulage (wood chip fuel supplier), (03) 455 1111.

## See also:

Little Sisters of the Poor – switching to wood energy for energy efficient, cost-effective heating

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