

Wigram Lodge – tenants cosy up to wood

Commercial, residential and community spaces with large heating and hot water requirements often struggle to maximise the efficiency of their systems while keeping costs down.

Wood energy is a cost effective, efficient and environmentally friendly option for heating.

Christchurch's Wigram Lodge needed to reduce costs and improve reliability of its heating and hot water system for residents. So a wood-chip fired boiler was installed - saving money, improving energy efficiency and tenant comfort.

Christchurch based accommodation provider

Christchurch's Wigram Lodge provides accommodation for up to 200 residents needing mid- to long-term accommodation.

Some of the single rooms include en-suite bathrooms and there are also communal bathrooms, lounges, laundries and kitchens for shared use.

Tenants, who vary from workers, students to travellers, pay a fixed weekly rental that includes all their hot water and heating.

Seeking greater reliability

Liz Harris, who has owned Wigram Lodge since 2001, inherited an old LPG system that supplied all the heating, cooking and hot water requirements.

The system was becoming increasingly expensive and delivered unreliable water pressure and temperatures, particularly on the top floor of the buildings.

In addition, there were mechanical failures in the gas units nearly every week, including leaks that could potentially put tenants at risk.

When the LPG system was down for repairs, electricity could supply the hot water and tenants could use electrical heaters in their rooms instead of the radiators. As a result, the electricity bills increased substantially.

The ideal solution

Improving reliability, safety and cost efficiency were the key drivers for Liz as she began to consider the various energy alternatives.

Upgrading the existing LPG boiler was ruled out due to the ever increasing cost of LPG.

After further research, she chose to install a wood chip boiler as the most cost effective option, costing 3.9c per kilowatt hour.

The new wood boiler supplies all of the domestic and heating hot water for the lodge including the radiators in every room, hallway and living area.

In winter time, the heating is set on an automatic timer that comes on every morning and night, ensuring that the lodge is warm 24 hours a day. All year round, tenants can also use a 'booster' button, which activates the radiators for a 3 hour period.

Wood-chip boiler

A 1MW automated coal boiler converted to run on wood chip has replaced the three old LPG units.

Twice a week, wood chip is delivered to the site and a blower loads the chip into the silo. The wood chip is fed via gravity into the auger and then into the boiler.

No other changes were necessary in the lodge as radiators and existing hardware were compatible with the new system.



Wood-chip fired boiler at Wigram Lodge.

✓ Key features

- Installation of 1MW Morrow boiler converted to operate on wood
- Capital expenditure \$270,000
- Wood chip costs 3.9c/kWh
- Fully automated system
- Ash is used as garden fertiliser
- Wood chip boilers best suited Canterbury users with up to one megawatt requirement (due to supply)

✓ Key benefits

- Annual savings between \$37,000 - \$52,000
- Simple payback of 3-4 years
- 50% winter energy savings estimated
- Virtually smoke-free chimney
- CO₂ emissions have been reduced by 146 tonnes p.a.
- Reliable, safe and cheaper than LPG and wood pellets
- Warmer, happier tenants

✓ Sector relevance

- Any, but especially suitable for:
- Educational institutions
 - Offices
 - Hospitals
 - Aged care



Warmer, cheaper, happier

The boiler upgrade has vastly improved the level of services provided by Wigram Lodge with hot water at a much more consistent temperature and the lower operating cost allowing longer heating hours in winter. Plenty of hot water and a warm environment has increased tenant satisfaction.

As Wigram Lodge enters its first winter with the new boiler system, Liz envisages energy savings of 50%. This includes having the buildings heated all day long as opposed to just a few hours with the LPG system.

Not only have Liz's energy bills reduced substantially, but so have Wigram Lodge's CO₂ emissions by approximately 146 tonnes per year because wood is nearly carbon neutral.

Redesigning the hopper to suit wood-chips

A common problem with wood chips being fed into the auger is 'bridging'. This is when the flow of wood chips gets stuck, so that while the auger underneath the wood chip pile is spinning, chips have 'bridged' themselves across the mouth of the auger. This effectively stops the free flow of wood chips into the boiler.

In the early stage of the project, the wood was manually fed into the auger to ensure a continual supply of wood chip. After redesigning the hopper to be taller and thinner, gravity has now overcome the bridging problem, enabling a fully automated feeding system.

If the wood-chip fits...

Liz, who owns many apartments in the inner city and has recently opened a large accommodation complex in Nelson, says that while every organisation's requirements are different, wood has always been a cost effective option when looking at the 'kilowatt output per dollar' ratio.

She believes that where an existing coal burning boiler exists, a change to wood chips should be considered, because conversion can be reasonably straight forward.

Key personnel

Liz Harris (Owner, Wigram Lodge)
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More information

Guidelines for the conversion of solid fuel boilers (from coal to wood pellets)
www.eecabusiness.govt.nz/node/14118

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Wigram's perspective

Liz Harris, Owner:

"We've got it running absolutely beautifully now, with no problems at all, but it did take us a while to get it sorted out. It's a far better system than what the LPG system could deliver which was so expensive to run you had to think twice about using it to keep everyone warm. Now with wood chip, the radiators are hot, the hot water is hotter than it's ever been, there aren't any smells, virtually no smoke is emitted from the chimney and there has been not one negative comment from the tenants that live there - just 200 happy tenants.

"I wish I had done this earlier - we struggled with the old system for years with inferior results, complaints from the tenants and much anxiety for the staff and myself as to when it would break down again.

"In my opinion, wood chips are a fantastic solution, and I'd like to see other organisations with large space energy requirements consider it. It's totally automated, you don't have to touch it, it's got incredibly hot water, everybody's really warm, everybody's really happy."



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