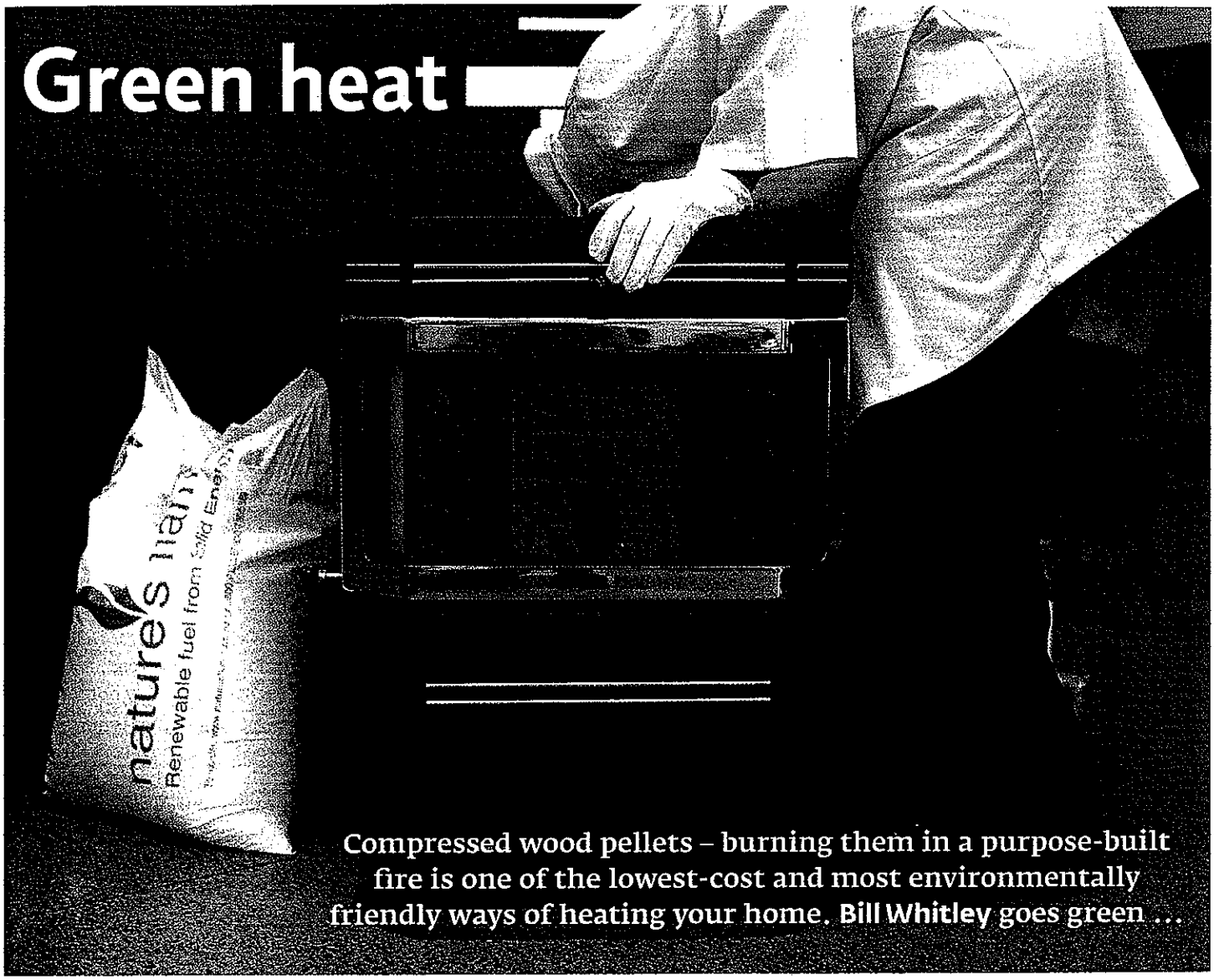
Green heat



Compressed wood pellets – burning them in a purpose-built fire is one of the lowest-cost and most environmentally friendly ways of heating your home. **Bill Whitley** goes green ...

Pellet burners are relatively new in New Zealand, although they're well established in North America and Europe. Most pellet burners look like a conventional woodburner – and are available free-standing or as an existing fireplace insert. You can even get a basement-mounted furnace for central heating. Our firewood tests tell us they're probably the least polluting form of heating for normal home use. So what's the "goss"?

Significantly different from a woodburner

With its fire-glass front door, a pellet burner may look like a conventional woodburner. But it's significantly different. It burns only compressed wood pellets, which you buy in 20kg plastic bags. The pellets are loaded into a hopper at the back of the unit and are fed into the fire by an automatic feed system. Adjusting the rate the pellets are consumed gives you control over the amount of heat produced.

In some models, a thermostat can be used to keep an even room temperature – and a timer can provide automatic switching-on and -off. With freestanding and insert models a hopper load of pellets lasts for around 24 hours of continuous burning, and these models produce a similar amount of heat to a conventional woodburner.

Burning wood is carbon-neutral. The carbon dioxide emitted from burning wood is absorbed by growing trees.

Most pellet burners are imported, mainly from Canada or Europe – although Parkwood and McKenzie are now producing locally manufactured models. We think there's potential for more pellet burners designed and made in New Zealand.

Easier on the environment

Woodburners spewing ultra-fine soot particles into the still night air are a major cause of winter atmospheric pollution in New Zealand. And that's not just in Canterbury and Nelson. Because of New Zealand's topography, there are many valleys and basins where the pollution can get trapped. ►

These soot particles are so fine that they can lodge in people's lungs and contribute to a number of respiratory diseases.

Woodburners have got cleaner in recent years. Under laboratory conditions and using special test fuel, the cleanest models will produce less than 1.0 gram of fine-particle soot for every kilogram of fuel burnt. Pellet burners are slightly cleaner – under lab conditions, most are in the range of 0.5 – 0.7 grams.

In the real world, however, it's completely different. Install a pellet fire and the emissions from your burner would be close to the laboratory test results (because the fuel you burn is the same as the test fuel). But with a woodburner – as our firewood burning test last year showed – the emission figures for normal firewood will never equal the lab test figures, and could be up to 50 times higher.

Pellet fuel is produced from sawmill waste, often sawdust and wood shavings. The waste is compressed, then dried. No glues or other binders are used, so the pellets are 100 percent wood.

Burning wood is carbon-neutral. The carbon dioxide emitted from burning wood is absorbed by growing trees. And so burning wood doesn't contribute to the build-up of atmospheric carbon dioxide, unlike burning fossil-fuels.

Verdict? A pellet fire is probably the cleanest and greenest home-heating system available.

Running costs

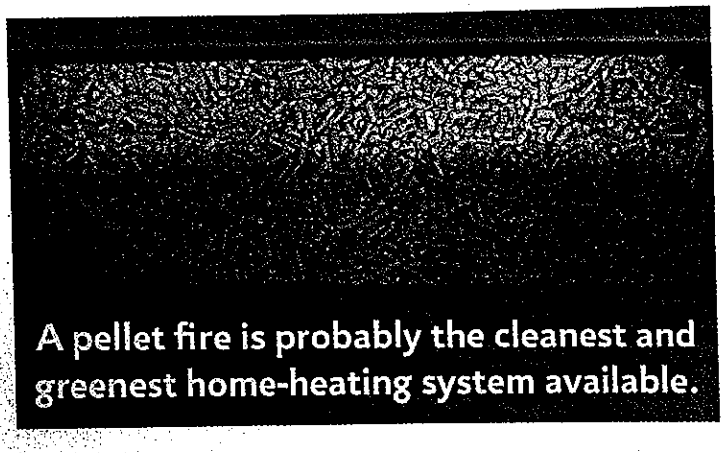
Running a pellet burner costs around 7¢ to 9¢ per kWh. This is slightly more than a woodburner (using bought firewood), and about the same as a heat-pump – but less than half the cost of running a conventional electric heater. They're also cheaper, or competitive with flued reticulated gas heaters and central heating – depending on regional prices. (See "Clean, green – and cheap" elsewhere in this issue.)

Market potential

Pellet burners could become a major force in New Zealand home heating. We have plenty of wood-waste from our timber-processing industries.

There are now five pellet plants throughout the New Zealand. Total national production capacity is around 100,000 tonnes per annum, but last year production was around 20,000 tonnes. So there's room for growth in the industry.

Burning pellets is sustainable and about as pollution friendly as home heating can get. What is needed is a better infrastructure for selling the pellets, and for a greater range of heaters to be more widely available.



A pellet fire is probably the cleanest and greenest home-heating system available.

Pellets can be obtained from some hardware chains and home-heating shops. Bulk deliveries can be arranged by calling 0800 PELLET. Prices vary from $8.75 to $12 per 20kg sack, depending on your location.

We suggest you check on pellet price/availability in your area before you purchase a burner.

Pros and cons

Pellet burners have many **advantages:**

- No more chopping or storing firewood.
- Most models light electrically – no need for matches or firelighters.
- Some can be set to switch on or off, using a timer.
- With most models the room temperature can be thermostatically controlled.
- They usually have a smaller diameter flue than woodburners, which may make installation easier. The flue can also be taken out horizontally through an external wall.
- They burn very cleanly, so are less of a community health hazard.
- The pellets are made from sawmill waste – burning it is carbon-neutral.
- The fuel is manufactured from an abundant renewable resource.

But **nothing is perfect** in this world:

- Pellet burners are expensive to buy compared with woodburners and gas heaters. Prices start at around $3500 (including burner and flue), and then there's installation.
- They can only burn pellets – no free firewood.
- They require electricity to work, so they're no use during a power cut. A 12-volt battery and inverter or a small generator could be used as a back-up power-supply system. But they add to the cost.
- The burners are more complex than a woodburner, with electrical and electronic components that can fail.
- They have fans and a hopper-feed motor, so they make some noise. Some models can have the flue fan mounted outside the house to reduce noise.
- Currently there's a limited range of pellet-supply retail outlets, but the situation is improving.
- Some energy is lost in manufacturing and transporting the pellets.

We say

- A pellet burner can be considered as an environmentally sound replacement for other forms of home heating.
- If you have access to free or low-cost firewood, a pellet burner is probably not for you.
- A pellet burner is quite expensive to buy, compared with woodburners or gas heaters. But, unless you're burning free firewood in a woodburner, a pellet burner's running costs are about as low as they get.
- The distribution and supply of pellet fuel needs to be widened – and promoted.

Model	Type	Water heater	Thermostat	Timer	Price ($)	Flue price ($)
MCKENZIE HEATING DESIGN ECO BOILER CENTRAL HEATER	B	●	●	●	6300	A
[illegible]	B	●	●	●	[illegible]	A
NATURE'S FLAME ENVIRO EF-5	FS		●		3599	595
[illegible]					[illegible]	[illegible]
NATURE'S FLAME ENVIRO EF-2	FS				2899	595
[illegible]		●	●		[illegible]	[illegible]
NATURE'S FLAME ENVIRO EF-3	FS	●	●		3499	595
[illegible]	FS		●	●	[illegible]	[illegible]
PARKWOOD PELLET FIRES PARKWOOD YF3FPI	I		●	●	3299	400
[illegible]	FS		●	●	[illegible]	[illegible]
W H HARRIS RIKA PREMIO	FS		●	●	6399	525
W H HARRIS RIKA VISIO	[illegible]		●	●	[illegible]	[illegible]
W H HARRIS RIKA MEMO	FS		●	●	4399	525
WOOD PELLET FUELS EUROPA	FS		●		[illegible]	[illegible]
WOOD PELLET FUELS GNOME	FS		●	●	4750	400
WOOD PELLET FUELS PARLOUR 3000	FS		●	●	[illegible]	[illegible]

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GUIDE TO THE TABLE TYPE: B: Basement mounted furnace; **FS:** Free standing; **I:** Insert – fits into existing fireplace. **Thermostat:** Allows the room temperature to be automatically maintained at a set temperature. **Timer:** The fire can be automatically started and stopped at pre-set times. **PRICE:** Fire only – includes GST, but not installation. **Flue price:** Standard flue kit for single-story dwelling. [A] Depends on installation.

Checklist

Free-standing/insert/basement furnace All three versions are available. Unlike woodburners, fireplace insert pellet-burners produce as much heat and are as efficient as freestanding models. The basement furnace models are connected to water-filled radiators in the house, or via a heat exchanger, to standard central-heating air-ducts to distribute heat throughout the home.

Wetbacks Some models have provision for a wetback. This can reduce your hot-water bill, but possibly not enough to recoup the wetback's expensive installation costs.

Heat output The maximum output of most lounge-installed pellet burners is in the 9 to 11 kWh range. But overheating of the room is less likely with a pellet burner because the heat output is controllable over quite a large range – usually 1.9 to 11 kWh.

Controls Pellet-burner controls – the on/off switch, start button, and heat-control knob – are electrical.

Cleaning Pellet fires produce less ash than a conventional woodburner. Often, the ash will only need emptying once per week. Most models have a pull-out ash tray.

Flue system Flues are typically 75mm in diameter, which is smaller than a conventional woodburner. Many flue arrangements are possible. Insert models can have their flue inside an existing chimney; and freestanders often have their flue exiting the room horizontally through an exterior wall and then running up the outside of the building.

Installation costs Every house is slightly different, but installation costs should be similar to those of a woodburner. Remember a power outlet needs to be nearby.

Safety guards The surfaces of a pellet burner can get very hot and be a danger to small children. Protective guards are available and highly recommended.

Building consents You must obtain a building consent from your local authority to install a pellet burner.