

Education Facilities Using Wood Fuel

The number of heat plant fuelled by wood pellets or chips in New Zealand (particularly in school and tertiary education establishments) continues to rise, as do the number of different parties offering installation and conversion services. Compared to coal, there are a number of obvious advantages to using wood pellets or chips, the most obvious of which is that they are a relatively clean burning and sustainable fuel. Added advantages include ease of use, cleaning and maintenance.

Choice of heat plant

Cost will always be a factor in anyone's choice of fuel and heat plant technology. Many education establishments for example have funded the replacement of their existing heat plant and shifted from coal to wood fuel in the process. Others have been able to convert existing heat plant from coal to run on wood fuels.

For the 'over 60' heat plant listed in this note, the total estimated capacity is around 31,000¹ kW.

Wood Fuel – Quality

Whatever the application, the use of appropriate quality fuels is paramount. The BANZ Solid Biofuel Classification Guidelinesⁱ set out the standards for all wood fuel types. This is an industry lead initiative with Government support. The type and quality of fuel has to match the design of the heat plant. Not all heat plant designs are the same. There can often be a trade-off of capital cost vs operating cost when evaluating total lifetime cost.



Guidelines for the Conversion of coal plant to wood fuelling

BANZ has developed a Technical Guide which is intended to provide guidance on the conversion of existing coal fired heat plants to wood pellet operation. The Guide covers all aspects of conversions from coal to wood fuel.ⁱⁱ Converted coal boilers should also meet the EECA guide for PM10 emission.



Registered Wood Energy Advisers

Bioenergy Association maintains a list of Registered Wood Energy Advisers who have shown that they meet recognised levels of experience and knowledge.

Education establishments using wood fuel for heating

The table following is the best estimate of the education establishments using wood fuel for heating, the location, the heat plant output, the fuel type and if its been a new heat plant or a conversion.

¹ note that details on a number of heat plant in the table are not available. Our best estimate of their size is around 200kW each and this has been used in the calculations.

	School	City	Conversion / Replacement	Fuel Used	Heat plant output (kW)
1	Dunstan High School	Alexandra	Replacement	Wood Chip	250+650
2	Te Puke Intermediate	Bay of Plenty	Conversion	Wood Pellet	700
3	Edgecumbe College	Bay of Plenty	Conversion	Wood Pellet	645
4	Rangiora High School	Canterbury	Replacement	Wood Pellet	2 x 640
5	Cashmere High School	Christchurch	Replacement	Wood Pellet	1460
6	Mairehau High School	Christchurch	Conversion	Wood Pellet	660
7	Glenmoor School	Christchurch	Replacement	Wood Pellet	150
8	Papanui High School	Christchurch	Conversion	Wood Pellet	1125
9	Otago Uni	Dunedin	Conversion	Wood Chip	20 x various 200-1100
10	Shirley Intermediate School	Christchurch	Conversion	Wood Pellet	?
11	Central New Brighton Primary School	Christchurch	Conversion	Wood Pellet	300
12	Kakatahi School	Whanganui	?	Wood Fuel	?
13	Rudolf Steiner School	Christchurch	Conversion	Wood Pellet	400
14	Hillmorton High School	Christchurch	Replacement	Wood Pellet	?
15	Taieri College	Dunedin	Conversion	Wood Pellet	1460
16	Balmacewen Intermediate	Dunedin	Conversion	Wood Pellet	530
17	Otago Boys High	Dunedin	Conversion	Wood Pellet	1460
18	Logan Park High School	Dunedin	Conversion	Wood Pellet	1460
19	Katikati Primary School	Katikati, WBoP	Replacement	Wood Pellet	200
20	Katikati College	Katikati, WBoP	Replacement	Wood Pellet	220
21	Tahuna Normal Intermediate	Dunedin	Replacement	Wood Chip	400
22	Clutha Valley School	Dunedin	Replacement	Wood Pellet	200
23	Golden Bay High School	Golden Bay	Replacement	Wood Chip	350
24	Westland High School	Hokitika	Replacement	Wood Chip	500
25	New River School	Invercargill	Conversion	Wood Pellet	?
26	Kaiapoi High School	Kaiapoi	Conversion	Wood Pellet	1000
27	Ellesmere College	Leeston	Conversion	Wood Pellet	430
28	Macleans College	Manukau	Conversion	Wood Pellet	533
29	Firth School	Matamata	Conversion	Wood Pellet	300
30	Matamata Intermediate	Matamata	Conversion	Wood Pellet	?
31	Matamata College	Matamata	Conversion	Wood Pellet	1400
32	Galatea Primary	Murupara	Conversion	Wood Pellet	150
33	Paekakariki School	Paekakariki	Conversion	Wood Pellet	200
34	Aorangi Primary School	Rotorua	Replacement	Wood Pellet	150
35	Rotorua Girls High	Rotorua	Conversion	Wood Pellet	?
36	Sunset Primary School	Rotorua	Conversion	Wood Pellet	?
37	Selwyn Primary School	Rotorua	Conversion	Wood Pellet	?
38	Western Heights Primary School	Rotorua	Conversion	Wood Pellet	?
39	Lake Rerewhakaaitu School	Rotorua	Conversion	Wood Pellet	?
40	Taumarunui High School	Taumarunui	Conversion	Wood Pellet	?
41	Otumoetai Intermediate	Tauranga	Conversion	Wood Pellet	400
42	Thames High School	Thames	Replacement	Wood Chip	300
43	Timaru Boys High School	Timaru	Conversion	Wood Pellet	1295
44	Tokoroa High School	Tokoroa	Replacement	Wood Pellet	200
45	Te Aroha Primary School	Waikato	Conversion	Wood Pellet	200
46	Henderson Valley School	Waitakere	Replacement	Wood Chip	149
47	Menzies College Trust	Wyndham	Replacement	Wood Pellet	800
48	Awakeri School, Whakatane	Whakatane	Replacement	Wood Pellet	95
49	Nelson College for Girls	Nelson	Replacement	Wood Pellet	540

50	Mangamuka School	Northland	? ⁱ	Waste Wood	? ⁱⁱⁱ
51	Matakohe School	Northland	? ⁱ	Waste Wood	? ⁱ
52	Nayland College	Stoke	? ⁱ	Wood Pellet	? ⁱ
53	Donovan Primary School		? ⁱ	Wood Fuel	? ⁱ
54	Salmond College	Dunedin	Replacement	Wood Chip	400
55	Otago Polytech	Dunedin	Replacement	Wood Chip	2 x 650
56	Mercer School		? ⁱ	Wood Fuel	? ⁱ
57	Marco School	Stratford	? ⁱ	Waste Wood	? ⁱ
58	Waihopai School	Invercargill	Replacement	Wood chip	200
59	Putauaki Full Primary	Kawerau	? ⁱ	Waste Wood	200
60	Nelson College	Nelson	? ⁱ	Wood Pellet	? ⁱ
61	Nelson College for Girls	Nelson	Replacement	Wood Pellet	540
62	Knox College	Dunedin	Replacement	Wood chip	540
TOTAL (est) (kW)					31,000

Case Studies

One of the easiest ways to find out more about the success of wood fuel heating at an education facility is to look at a Case Study. A number of Education Case Studies are presented on the UseWoodFuelNZ website (at <http://www.usewoodfuel.org.nz/wood-energy-case-studies>).

Project Details – BANZ Bioenergy Facilities Directory

Further details on the schools and other education facilities listed above can be found in the BANZ Bioenergy Facilities Directory (www.bioenergyfacilities.org). The directory is a source of information on bioenergy facilities in operation throughout New Zealand, or to facilities developed by New Zealand based companies. The directory can be used to find out more about the wide range of uses of bioenergy in New Zealand today and to find those specialists with the experience to build similar facilities.



Accredited Wood Fuel Suppliers

The Bioenergy Association has a scheme for listing Accredited Wood Fuel Suppliers. These are fuel suppliers who have shown to an independent party that they have quality assurance methods which will ensure that they deliver specified wood fuel consistently and reliably. The scheme is backed by the Association's Professional Standards and Complaints procedures.

Sourcing Wood Fuel Equipment

The [Wood Fuel Equipment Catalogue](#)^{iv} on the UseWoodFuelNZ website provides information on the wide range of equipment available in Australasia. Equipment has been presented in the following categories:

- Monitoring and measuring (Moisture and Emissions)
- Wood fuel production (Chippers and Shredders, Drying, Transport)
- Wood fuel handling and storage
- Heat plant (combustion plant, gasifiers, ancillary equipment, air quality and residential heaters)
- Electricity generation.

When seeking expert advice on decisions around new heat plant check first to see if they are members of BANZ - look for the BANZ Membership decal. Membership of the Association shows that the organisation is engaged in New Zealand's bioenergy sector and is keeping up-to-date with the latest technologies and market information.

ⁱ <https://www.bioenergy.org.nz/resource/tg01-solid-biofuel-classification-guidelines>

ⁱⁱ <https://www.bioenergy.org.nz/resource/tg02-conversion-solid-fuel-boilers-from-coal-wood-pellet-firing>

ⁱⁱⁱ Source – 2011 Heat Plant Database (Note - for Boiler output shown as '?' and '?'' - assume 200kW for illustration)

^{iv} <http://www.usewoodfuel.org.nz/catalogue.html>