

Pellematic wood pellet boilers 100% renewable central heating & hot water

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Pellematic pellet boilers from OcoFEN are a reliable, sustainable and affordable technology for central heating and domestic hot water. They can also heat spa pools, hot tubs or a swimming pool. Or to provide process heat loads of up to 0.5MW.

Pellematic boilers have been designed and developed by OcoFEN, a leading Austrian manufacturer of domestic and commercial pellet boilers established in 1990. They utilise advanced combustion control developed by OcoFEN so there is no need for a buffer tank for individual boilers.

Pellematic boilers come in 64kW modules and can cascaded to 512kW. A buffer tank is required for cascades as a hydraulic separator. As a cascade the Pellematic system has a high degree of redundancy and an enormous modulation range.

NZ manufactured wood pellets

Pellematic boilers burn wood pellets. These pellets are manufactured in New Zealand from waste sawdust and wood shavings, materials that usually end up in landfill if not used.

Over 100,000 tonnes of pellets are manufactured annually in NZ. There is a well-established commercial distribution network using blower trucks to deliver fuel. Pellets have very high energy density with 5,000kWh per tonne (1.5m³).

Peak output	No. boilers	Minimum Output
64kW	1	19kW
128kW	2	
192kW	3	
256kW	4	
320kW	5	
384kW	6	
448kW	7	
512kW	8	

Wood pellets are the lowest carbon energy source for central heating and hot water

Heating technology	Fuel	Fuel CO ₂ emissions factor kgCO ₂ / kWh*	System Efficiency	Delivered heat emissions factor kgCO ₂ / kWh
Pellematic boiler	Wood pellets	0.003	95% standard	0.0032
			103% condensing	0.0027
Heat pump	Electricity	0.0977	300% nominal	0.0326
Gas boiler	Natural gas	0.195	95% standard 103% condensing	0.205 0.177
	LPG	0.222	95% standard 103% condensing	0.234 0.201
Diesel boiler	Diesel	0.266	80-95%	0.333 to 0.28

* Figures from Ministry for the Environment; Measuring Emissions, 2019

Comparative Global Warming Potential

In addition to being ten times more efficient for carbon emissions than heat pumps, burning wood pellets avoids the use of refrigerants. Refrigerants have a very high Global Warming Potential. Depending on the refrigerant, if released in to the atmosphere it will be a 670 to 2,000 times more potent greenhouse gas than carbon dioxide. Each kilo of refrigerant is the equivalent of 0.7 to 2 tonnes of carbon dioxide emissions if released to the atmosphere. This is an important consideration as most heat pump failures occur because of refrigerant leaks and appropriate end of life disposal of the complete system also becomes absolutely critically important.

Automated fuel supply, deashing & reminders

Pellematic boilers are highly automated and perform in a very similar way to fossil fuel equivalents. Bulk fuel store combined with automatic vacuum refuelling means the boilers operate independently. The ash container holds 25kg and only needs to be emptied after over 4 tonnes of pellets are burned, the equivalent of 20MWh of output. With cascaded boilers operating this is going to infrequent except with the largest constant loads.

Once the fuel is starting to run low the boiler will automatically send an email to the building manager to remind them to order more pellets.

Running costs

Pellets are available in bulk deliveries from Nature’s Flame and Azwood. The average cost of fuel for a commercial premise is around 7c/kWh delivered, exc GST (\$350 / tonne). Multiple year fuel contracts are available to provide security of supply and running costs. Prices will vary depending on the amount of storage, quantity used per year and location.



Comparison of energy use and running costs as a guide

Heating technology	Monthly energy required	Fuel used	Fuel cost per month	Fuel cost per kWh
Pellematic boiler	10,000 kWh	2.1 tonnes	\$737	\$0.07
Heat pump		3,333 kWh	\$567	\$0.06
Gas boiler – natural gas		10,526 kWh	\$526	\$0.05
Gas boiler – LPG		810 kg (4 x 210kg bottles)	\$1,836	\$0.18
Diesel boiler		1,059 litres	\$1,116	\$0.11

* Efficiency figures = all boilers 95%, heat pump 300% (average COP of 3)

* Fuel costs = 7c / kg pellets, 17c/kWh electricity, 5c/kWh natural gas, \$500/210kg LPG, \$1.06/L diesel, as per MBIE Energy Prices, January 2020

Savings

Sustainability

Independence