

Heat, power and CO₂ from biomass for Greenhouses

Reference plants industrial heat in New Zealand and Australia



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Transforming Biomass
Since 1965

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Forest residues
Bark, woodchips,
hogged fuel, and
sawdust

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K&L Nurseries wanted a boiler flexible enough to accommodate fuel of different sizes, making handling easier.

K&L also wanted to avoid being tied to using only very dry wood fuel, which increased energy costs and required special storage.

The boiler can handle fuel with up to 60% moisture content. K&L Nurseries now enjoys energy costs of only \$7 to \$8 per gigajoule (GJ).

Transforming biomass
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Over 3.000 installations

Since 2008 in New Zealand
with an established office in
the Hawke's Bay

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K&L Nurseries

Springston South, Canterbury, New Zealand

“A bold, trailblazing project has given this family business long-term low energy costs and renewable, carbon-neutral fuel – setting a new standard for biomass energy use in New Zealand.”



K&L Nurseries

900 kW hot water heat plant for glasshouses
Installed 2012



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Wood processing
residues, hogged fuel,
Bark, and sawdust

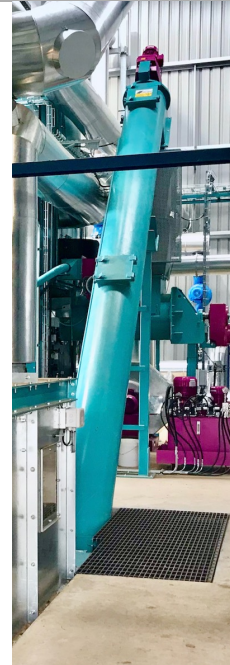
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Polytechnik Biomass Energy has installed a new biomass energy plant, fuel handling and emissions control systems.

The project also includes a two-million-litre insulated heat store, a transport station, and an underground district main that delivers energy to existing distribution centres on the property.

VWF offsets 60,000 tonnes of CO₂e over its expected lifetime by utilising forestry and timber processing residues.



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Van Wyk Flowers

Lyndhurst, Melbourne, Victoria, Australia

Van Wyk Flowers (VWF), a long-standing family business faced an almost overnight surge in energy costs that threatened to make it financially unsustainable. This was due to their dependence on gas, as premium quality year-round flower production necessitates high-tech heated indoor growing environments.



Van Wyk Flowers

2,950 kW hot water heat plant
for glasshouses installed 2018



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Wood processing residues, hogged fuel, Bark, and sawdust

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The system's flexibility allows it to accept various forms, sizes, and consistencies of fuel, even with moisture contents up to 60%.

Now equipped with this technology, the farmer's eggplant production business is well-positioned to thrive in a future market where rising fossil fuel costs and penalties for carbon emissions will be significant constraints for industries like theirs.



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Gippsland Produce

Yarragon, Victoria, Australia

Gippsland Produce, a premium-quality eggplant producer, achieved self-sufficiency and complete independence from its previous energy source, brown coal briquettes. By opting to use forestry and timber waste residue, they significantly reduced their running costs and avoided the burden of expensive fossil fuels like LPG.



Gippsland Produce

2,000 kW hot water heat plant for glasshouses installed 2014



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Wood processing residues, hogged fuel, Bark, and sawdust

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The system's flexibility allows it to accept various forms, sizes, and consistencies of fuel, even with moisture contents up to 60%.

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A&A Bayley

Yarragon, Victoria, Australia

A&A Bayley, a premium-quality tomato plant producer, achieved self-sufficiency and complete independence from its previous energy source, brown coal briquettes. By opting to use forestry and timber waste residue, they significantly reduced their running costs and avoided the burden of expensive fossil fuels like LPG.



A&A Bayley

1,600 kW hot water heat plant for glasshouses installed 2014



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Wood processing residues, woodchips, hogged pallets, and sawdust

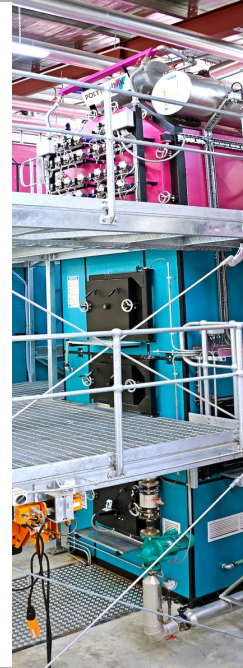
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Although the two biomass heat plants can handle biomass fuel with up to 60% moisture content, they often receive un-tanalised wood by-product.

Since this residue would otherwise have to go to landfill, Polytechnik's system can utilise it at a very competitive price.

"The boilers are amazingly efficient – 65 truckloads of timber produce only one cubic metre of solid ash waste."



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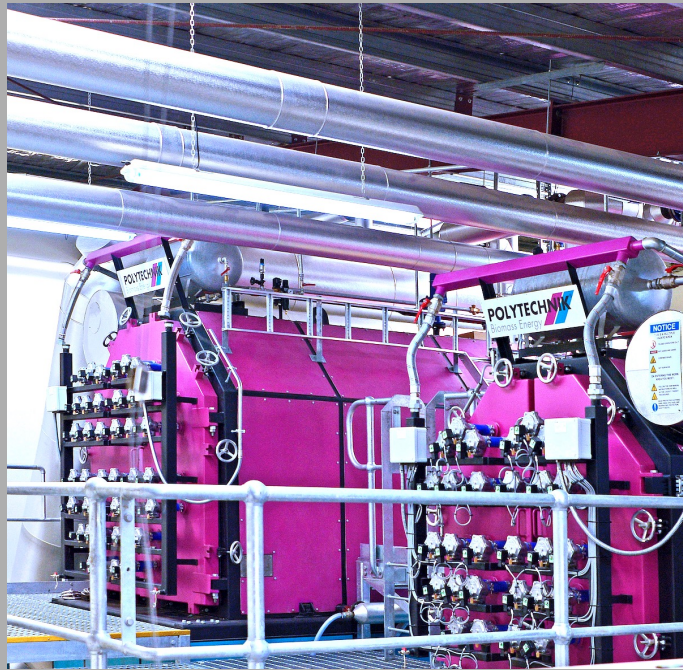
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Zealandia Horticulture

Christchurch, Canterbury, New Zealand

Zealandia operates two biomass boilers in Christchurch, which sit beside a 1 million litre, 10m tall heat storage tank. This tank runs water at the top, which may be close to boiling, while water near the bottom is pleasantly warm. This allows them to carefully and efficiently manage the heating requirements inside their glasshouses.



Zealandia Horticulture

1,600 + 2,500 kW hot water heat plant for glasshouses installed 2013



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Forests residues,
hogged low-grade
logs, bark, and
sawdust

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Designed to handle biomass fuel with up to 60% moisture content, low-grade forest residues are utilised in Polytechnik's heat plants to heat the glasshouses.

To become independent from the price fluctuations of higher-quality wood chips and dry wood fuels, Zealandia decided to invest in a large hogger.

This investment allows them to buy low-grade logs and slash from forest operations, which they then turn into high-quality hog fuel for their heat plant.



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Zealandia Horticulture

Clevedon, New Zealand

Zealandia operates two biomass boilers near Auckland, which sit beside a 2 million litre, 12m tall heat storage tank. This tank runs water at the top, which may be close to boiling, while water near the bottom is pleasantly warm. This allows them to carefully and efficiently manage the heating requirements inside their glasshouses.



Zealandia Horticulture

1,200 + 2,000 kW hot water heat plant
for glasshouses installed 2015 and 2022



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Wood processing residues, woodchips, hogged pallets, and sawdust

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A staged approach was taken, involving the installation of a large ring-main system, two two-million-litre heat storage tanks, and two 4.5 MW hot water heat plants.

The state-of-the-art biomass heat plant runs on wood residue sourced from local forests, generating all the heating required for 12 hectares of glasshouses that grow tomatoes, capsicums, and eggplant.

Installing the biomass system meant all coal boilers could be decommissioned.



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JS Ewers – MG Group

Richmond, Tasman, New Zealand

“The completion of the biomass boiler at JS Ewers is the single most significant project for the MG Group, removing approximately 27,000 tonnes of emissions annually. This project is not only a positive step forward for JS Ewers but for the industry more generally. A pleasing part of the project has been sharing our journey and learnings with other interested growers”



JS Ewers

4,500 + 4,500 kW hot water heat plant for glasshouses installed 2023



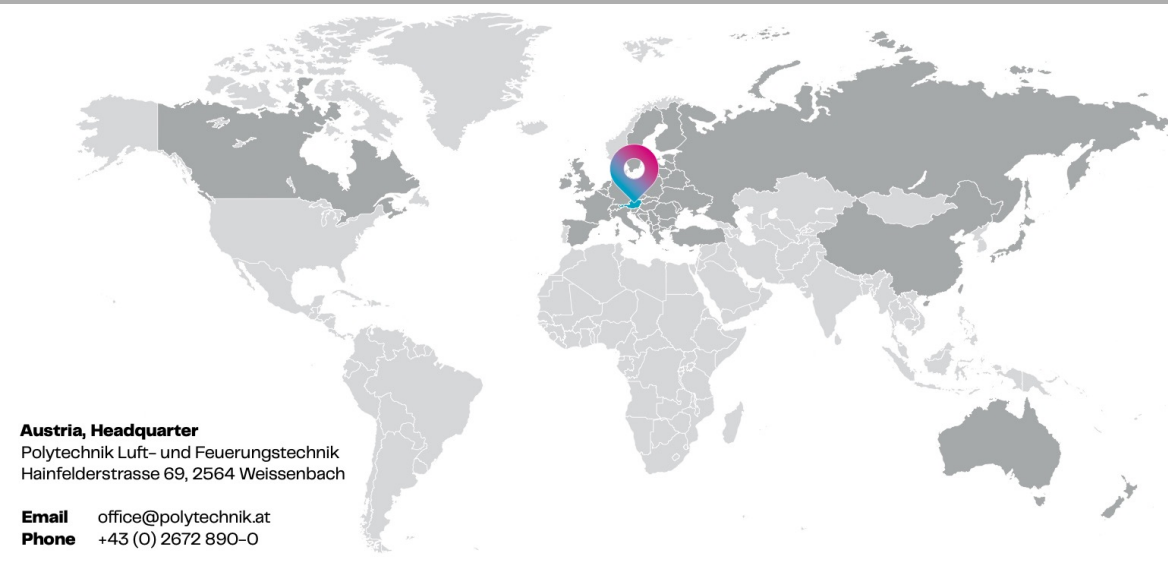
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Our Technologies

As one of the world's leading providers of sustainable and climate-neutral technologies, we integrate sustainability with industry. We specialise in generating heat and power from biomass and offer innovative solutions for biomass gasification, carbonisation and torrefaction.

polycombustion

Leading grate technology for maximum flexibility when utilising a broad spectrum of biomass for energy production.

Output range
1 MW – 30 MW thermal
200 kW – 20MW electric



polygasification

Highly efficient conversion of biogenic residues into syngas for the material and energy utilisation of stored solar energy.

ReGaWatt
990 kW – 20.000 kW thermal
250 kW – 5.000 kW electric

PolyHeld
400 kW up to 3 MW thermal



We provide innovative solutions tailored to our customers' needs. From initial concept to turnkey systems, we are a one-stop source of state-of-the-art technology designed for maximum efficiency and costeffectiveness.

- Customised plant design
- Combustion tests and CFD simulations
- Process engineering, design and planning
- Detailed 3D planning of the entire system
- Production in our Polytechnik factories and with trusted and long-standing partners
- Worldwide logistics
- Plant installation
- Piping and electrical installations and systems insulation
- Plant testing and commissioning
- Operator training and system handover
- Plant service and optimisation
- Fully automatic control and regulation, programmable logic controller (PLC)
- Process and system visualisation

polycarbonisation

Pioneering process for converting biogenic residues into a variety of valuable materials for energy and material utilisation as well as CO2 sequestration.

Carbonisation
up to 25.000 t/a per production line

Torrefaction
up to 60.000 t/a per production line

