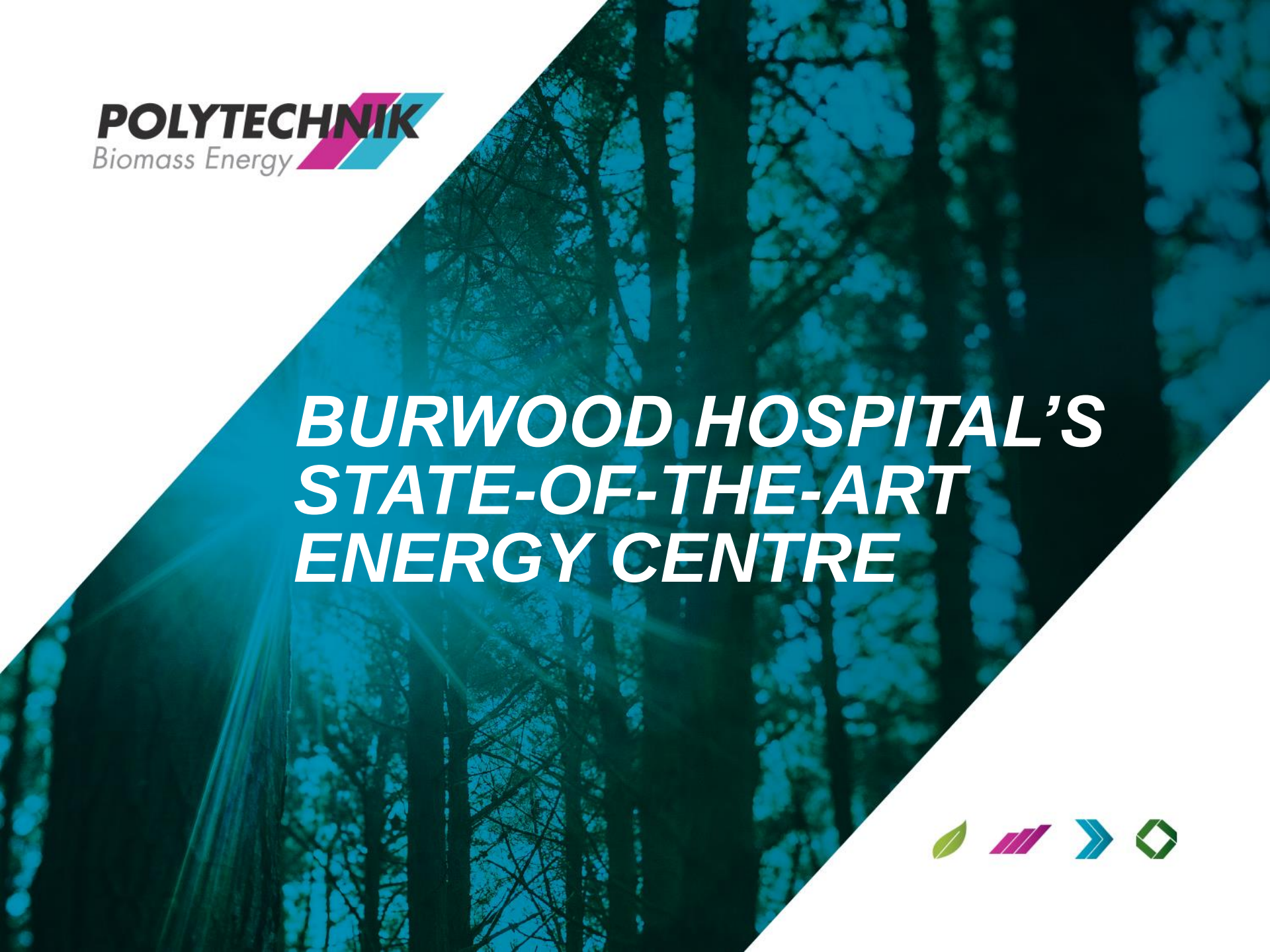

POLYTECHNIK
Biomass Energy
BURWOOD HOSPITAL'S
STATE-OF-THE-ART
ENERGY CENTRE

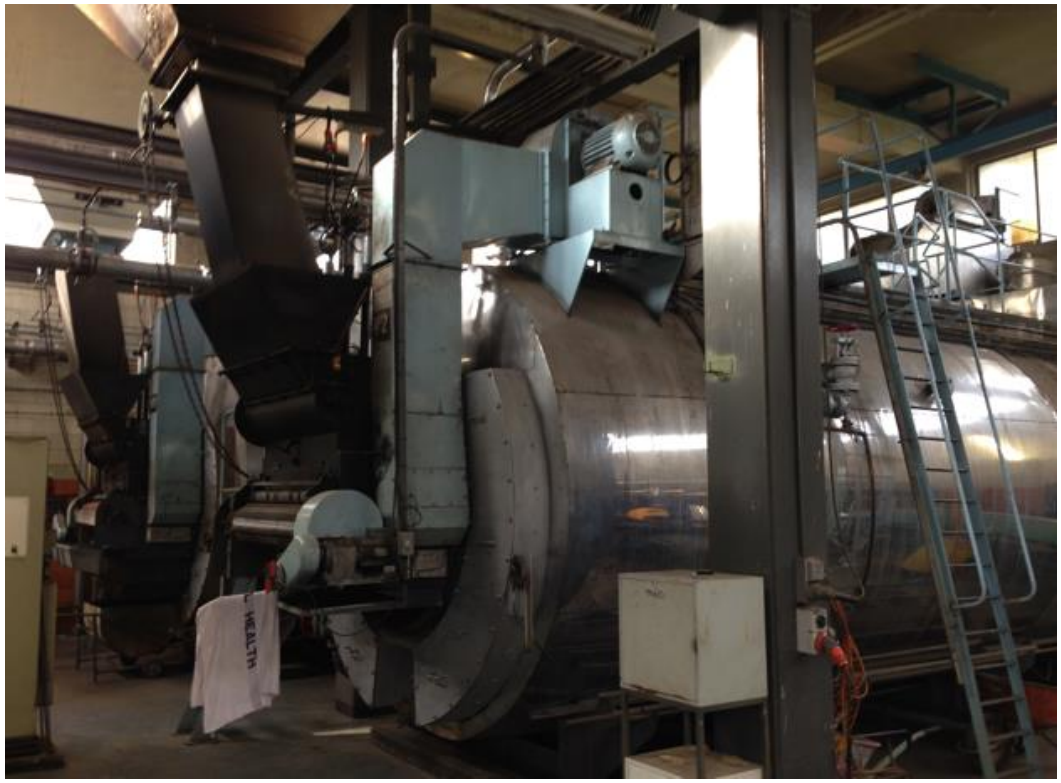
Burwood Hospital

2013

The aerial view is from early 2013, before the current development work began.

…and the 50 year old boiler house

Burwood Hospital's old coal boiler plant



The two 2.85MW coal fired boilers were commissioned in 1964 and are coal fed chain grate fire tube boilers. In Winter they use up to 7 tonnes of coal each day and 3-4 tonnes in Summer.

The fact they are still working is a credit to the maintenance and engineering team.

Coal became more expensive with increased Emission Trading Scheme charges and the sourcing of high quality energy-efficient coal became more challenging.

Redevelopment

2013

Burwood Hospital is the first cab off the rank in the close to $1 billion of hospital redevelopments underway in Canterbury. It is also the largest Government rebuild project in Christchurch East.

The $215 million facility focuses on services for older people which were previously located at The Princess Margaret Hospital. The new hospital is 32,000 square metres in size. The redevelopment was managed by the Ministry of Health in conjunction with the Canterbury DHB and services moved into the building progressively throughout June. The facility will be officially opened in August 2016.

Burwood houses 230 new inpatient beds. Half of the rooms are single rooms, with the other half accommodating two beds. Rooms have TVs, Wi-Fi and each ward has communal dining areas for patients, as well as family/whānau rooms.

Tender for 6 MW biomass energy plant

POLYTECHNIK Biomass Energy

2014

Specification

Burwood Hospital Redevelopment - New Boiler Plant
Performance Specification - Mechanical Services

at Burwood

Prepared for Ministry of Health

By Beca Ltd (Beca)

31 July 2014

Canterbury District Health Board
Te Poari Hauora ō Waitaha

MINISTRY OF HEALTH
MANATŪ HAUORA

Design, supply, installation and commissioning of the complete steam and LTHW generating plant for the Burwood Hospital site.

The extent of work includes all necessary items to generate steam and LTHW in a safe and energy efficient manner and includes but is not limited to:

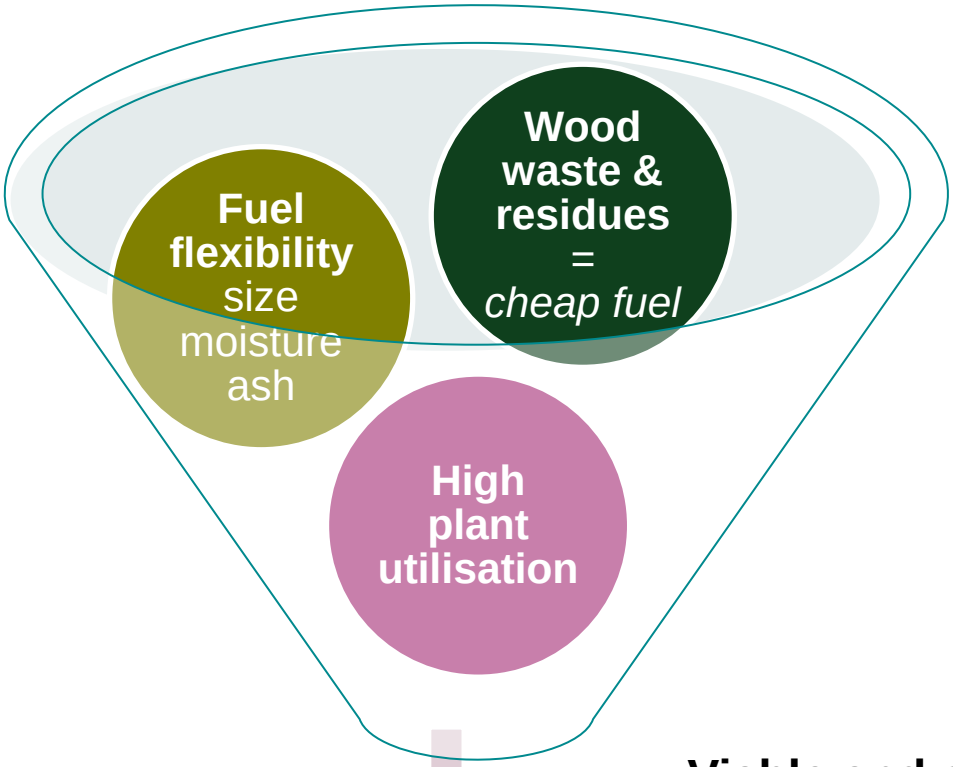
1 x 4MW biomass boiler
1 x 2MW biomass boiler
and 1 x 4MW diesel boiler (back-up)

Including inter alia the following features:

”A true biomass boiler designed to ensure complete fuel combustion within its combustion chamber”

Typical low cost biomass fuels

Successful Wood Energy Plants



Viable and economic biomass boiler plant

Polytechnik's concept wins

2014

Polytechnik Biomass Energy selected as supplier

Over 3,000 plants and 50 years of experience

Only European biomass boiler supplier with an established office in New Zealand

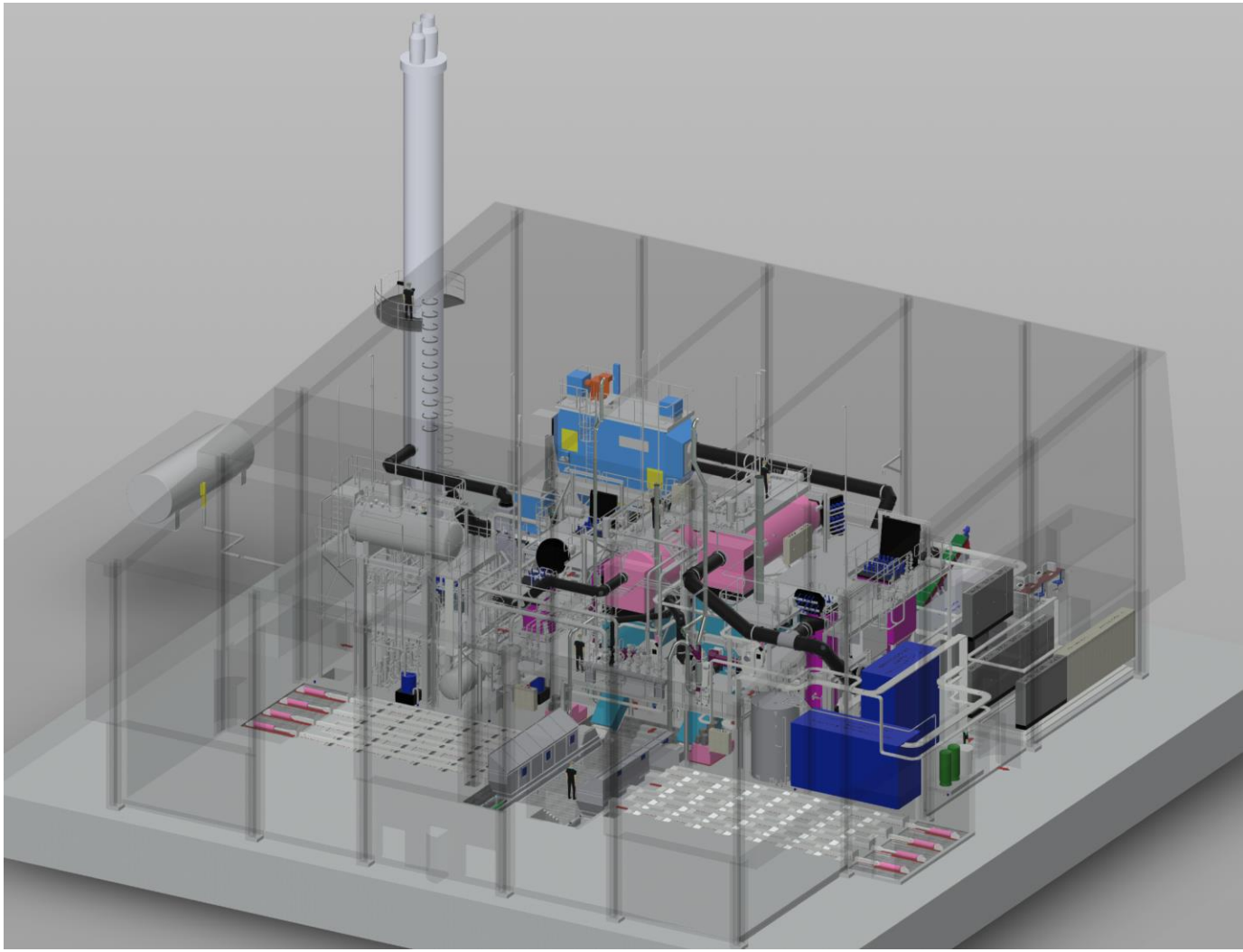
World-leading combustion system

Highest efficiencies

Lowest emissions

Fuel flexibility

Highly reliable



Steam boiler plant 6 MW with ESP

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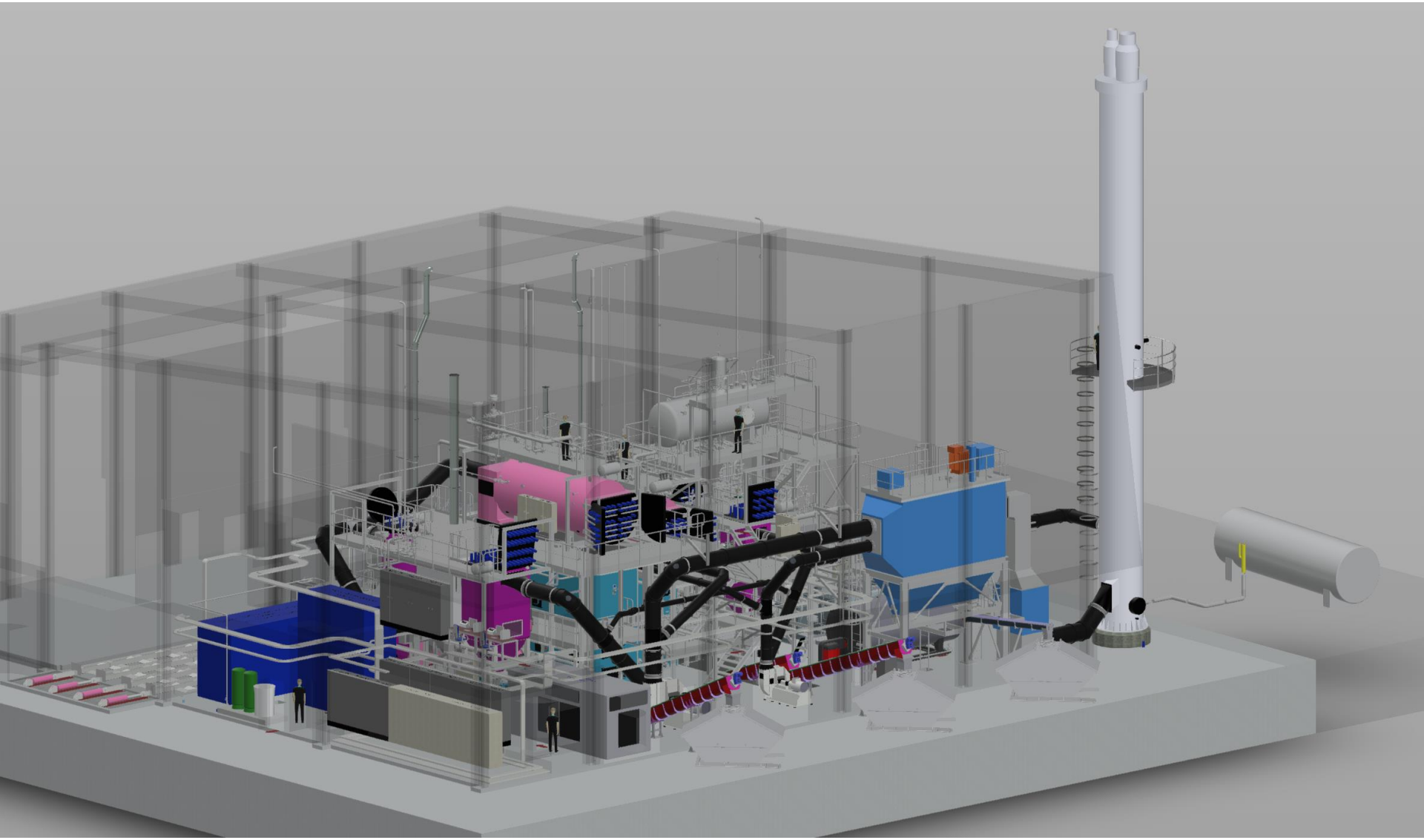


Building Design

Construction Phase

March 2015

In March 2015 the construction of the new hospital is well underway.

Start of the new boiler house construction.

Construction Phase

POLYTECHNIK Biomass Energy

June 2015

Polytechnik's boiler plant arrived, as per programme, at the beginning of June with foundation not ready for another 6 weeks.

Construction Phase

July 2015

Polytechnik gets the OK to lift the first components in place.

Construction Phase

August 2015

Fast progress due to the modular design of the components

Construction Phase

POLYTECHNIK Biomass Energy

September / October 2015

Due to the building design and the progress of the construction company, the mechanical installation of the energy plant has to follow the building progress:

“SAFETY FIRST”

Construction Phase

POLYTECHNIK Biomass Energy

November / December 2015

Finally the roof is on!

Construction Phase

POLYTECHNIK Biomass Energy

Summer 2016

As the building work continues Polytechnik Biomass Energy together with its partner Energy Plant Solutions continues to install the plant in the boiler house with sometimes over 30 workers.
…and no LTI!

Commissioning

POLYTECHNIK Biomass Energy

April / May 2016

After running 30,000 km of cables, 1,000 m of pressure pipe work, over 2,500 pipe welds with 10% being subjected to radiographic testing without a single failure and the installation of several hundred tonnes of equipment, the commissioning of the plant was, not surprisingly, carried out without any problems!

Commissioning

May 2016

…which of course makes Polytechnik's General Manager proud and happy.

Performance and Emission Tests

POLYTECHNIK Biomass Energy

June 2016

…fresh hogged fuel with wood sizes up to 350 mm and 45 to 55% moisture content and bark to fuel New Zealand's most advanced energy plant

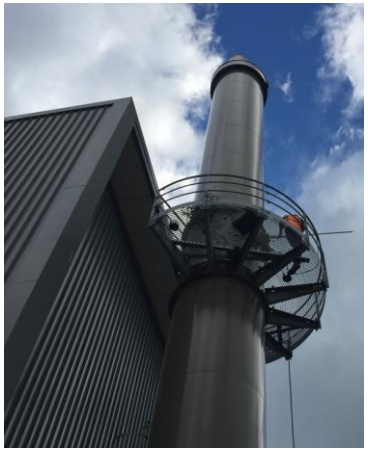
Performance and Emission Tests

1.1 Summary of Results

The following table summarises the results for sampling at Burwood Hospital, 255 Mairehau Rd, Burwood, Christchurch.

Table 1 Summary of Results

Year	Consent Condition PM_{10} Suspended Particulate (mg/m^3, 0°C, dry gas, 1 atm, 12% CO_2)	PM_{10} Suspended Particulate (mg/m^3, 0°C, dry gas, 1 atm, 12% CO_2)	Consent Condition PM_{10} Suspended Particulate (kg/h)	PM_{10} Suspended Particulate Mass Emission (kg/h)
2016	50	8.5	1.2	0.09



Due to the installation of a steam dump for the commissioning and the performance tests (allowed us to run the plant at 100%) the efficiencies and the emission guarantees could be confirmed over the whole operating range with particulate emissions of just 8.5 mg/m^3 (PM10) = 83% below the stringent particulate emission limit of 50 mg/m^3

Hospital takes over

POLYTECHNIK Biomass Energy

June 2016

New Hospital now heated with 100% renewable energy!

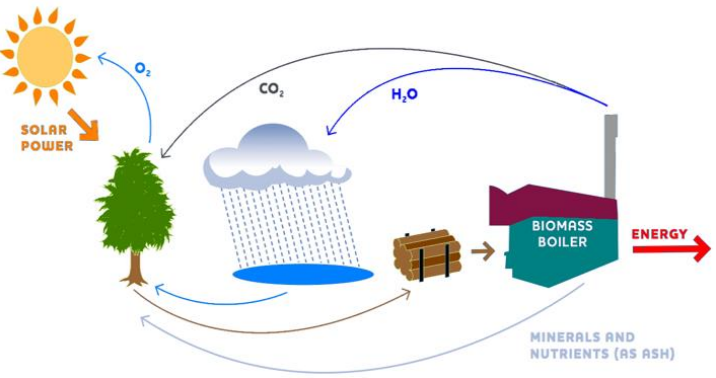
Biomass Energy

Wood waste reduces the energy cost of Burwood Hospital.

Burwood Hospital

POLYTECHNIK Biomass Energy

New Zealand's showcase of a modern and environmentally friendly hospital




POLYTECHNIK
Biomass Energy
THANK YOU
FOR YOUR
ATTENTION