

# Jesus College, Cambridge, 100kW



Jesus College, a grade 1 historic listed building, is part of Cambridge University situated in the centre of Cambridge.

## Building Regulations

There are strict building regulations to consider, when re developing listed buildings. The college decided to develop a new common room, which would have required extensive modifications to comply with building regulations, at a considerable cost.

## Biomass Boiler

In 2005 Econergy designed and installed a 100kW KWB automatic wood pellet boiler system with a 1500 litre buffer tank.

The installation meets all the colleges requirements for an efficient and clean source of space heating and hot water. As there are no fossil fuel Carbon Dioxide emissions, the system exceeds all current building regulations , without extensive and costly changes to the fabric of the building.

Right; 100kW KWB Pellet boiler and buffer tank in boiler room.

## Technical Summary

- **Heat exchanger:** upright, auto-cleaning tubular heat exchanger with special turbulators that remove fly ash and self clean the boiler tubes.
- **Fire shutter:** gas-tight, flashback-proof and tested.



Wood fuelled boilers Biomass energy services District Heating

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Above; Pellet delivery

### Technical Summary

- **Firing system:** auger-fed gasifier, ring-nozzle burner, high-temperature impact dome, turbulent burnout zone.
- **Ash-removal system:** automatic ash removal, ash compaction and filling-level monitoring.
- **Fuel extractor:** innovative conveying technology for individual requirements.
- **KWB COMFORT 3:** innovative, easy to use, fully automatic and unique.
- **Stoker worm:** stainless-steel thread with carbide coating

### Operation

- The fuel store is located in the adjacent room to the boiler room. This was built on site by building contractors to Econergy's design



Above; Auger transferring the pellets through the wall into the boiler.

- The fuel store dimensions are 5.2 metres by 3.2 metres and can hold approximately 10 tonnes of pellets.
- The pellets are automatically feed into the boiler via the screw feed auger transfer system when required
- This transfer system takes the pellets through the wall into the next room and then into the boiler
- In March 2006, The Energy Crops Company made its first delivery of wood pellets to Jesus College. The fuel was shipped in a specialist powder and granular fuel vehicle. The handling system on this vehicle allows deliveries to be pumped into the college store with minimal product degradation
- The fuel is delivered in 10 tonne loads
- The boiler uses approximately 2.5 tonnes of pellets per month
- Deliveries are kept to a minimum (3 per annum) due to the large store

### Pellets

Pellets are produced from sawdust without synthetic additives. Pellets have a higher energy content than woodchip therefore smaller fuel stores can be used. Pellet deliveries are blown directly into storage from a pneumatic tanker along a flexible hose, and can be blown up to 30 metres. Pellets are an ideal fuel for fully automatic heating systems where there are space and access restrictions.