BGI Ltd
Bio Global Industries

# CASE STUDY:
# WASTE WOOD RECYCLING

## Bio Global Industries

Bio Global Industries Ltd (BGI) is an innovative energy company that delivers a highly flexible solution to green energy generation in the UK. Their multi-fuel Biokompakt® boilers can burn a wide range of alternative, highly calorific and cost effective biomass fuels.

### Project Summary

We have been asked to provide some ideas and thoughts on the provision of heat to offices, a workshop and drying facility. The ideas and thoughts are designed to provide an overview of an option to utilize **waste wood** as a means of heating, earning income from the RHI Scheme and reducing tipping fees.

### Fuel

This proposal utilizes waste wood as the fuel source, to be classified Grade A,B. The selected boiler is able to burn waste wood fuel, and is also RHI compliant. This means that whilst saving on wood disposal costs, you will also earn an income from the RHI. For the purpose of this illustration, we have made the following assumptions:

| | |
|---|---|
| Waste wood disposal cost | £60 per tonne |
| Main gas | £0.03p per KwH |

### ADVANTAGES OF WASTE WOOD RECYCLING:

- Free heat and hot water
- Reduced tipping costs
- Government Incentive (RHI) gets paid per kW heat produced or 20 years
- Technical support to become a BSL fuel supplier providing a new income stream
- Improved green credentials

# Waste Wood Boiler

The boiler selected is a Biokompakt 130kW boiler. It is proposed to be supplied as a packaged Plant Room, delivered to site completely pre-installed and commissioned. In order to boost the heating during the peak heating system, a 100 kW back up boiler has been included. This will require manual loading but will enable the use of fuel and wood chip to suit availability, and also provide a heating boost during the heating season. It is a turnkey solution including all the required pumps, controls and flues, to operate upon delivery.

The Packed Plant Room is based on an ISO Container, and given the industrial nature of the site, it is proposed to leave the external finish of the container in its original condition. The internal finish is panelled, insulated and vented.

The container features a sliding roof design to enable the loading of the wood fuel from your bulk store using a telehandler and bucket arrangement. The container is able to hold 12m3 of wood chip, sufficient for the boiler to operate at full capacity for up to 4 days.

### Heat Consumption

The actual amount of heat you consume will fluctuate with external conditions, right down to how many times the external doors open and close.

# Business Case

**Income & Return Illustration** **230 kW Waste Wood System**

| | | |
|---|---|---|
| kWh produced | | 468720 |
| RHI Tariff | | 5.18 p |

| **Boiler Capacity (kW)** | | **230 kW** | |
|---|---|---|---|
| Annual Income | Tier 1 | £ | 15,655.00 |
| | Tier 2 | £ | 3,663.00 |
| | **Total** | **£** | **19,318.00** |

**Cost Comparison**

| **Boiler Capacity (kW)** | | **230 kW** | |
|---|---|---|---|
| Fuel Oil | | £ | - |
| Nat Gas Saving | | £ | 14,040.00 |
| LPG | | £ | - |
| Less Waste Disposal Cost | 90T @ £60 Tonne | £ | 5,400.00 |
| **Less Wood Cost** | | **£** | **-** |
| **Fossil Fuel Saved** | | **£** | **19,440.00** |
| | | | |
| **Net Annual Income/Savings** | (Fuel Saving + RHI Income) | **£** | **38,758.00** |

## Packaged Plant Room Equipment

- 1 x Biokompakt 130 kW Waste Wood Chip Biomass Boiler, complete with auto-feed mechanism, self-cleaning systems, automatic ash augers, bins and Lambda probes
- 1 x Vigas 100 kW Log Boiler c/w Ladommat and safety kit
- 40ft ISO Container—internally finished
- 1 x dedicated fuel feed auger mechanism (2.5m long)
- Insulated NRG8 Buffer Tank 300l for hydraulic separation of boiler and heat network
- Class 2.0 heat meter for measuring heat generation
- All plant room primary pipework, pumps, valves, fittings and controls in plant room and down-stream plant rooms
- Full pipe insulation in plant rooms
- Installation of the 2. no flue pipes supplied by Specflue, as detailed above
- Connection to provide services—Water & Electricity
- Local wiring and controls to include the option to monitor the boiler system remotely using a BMS wiring system
- CAT5/6 cable to the Till Point
- Connection into the underground heating system
- Design and supply of underground supply pipe work for the distribution of heat
- Connection and integration of the district heating into all the heaters
- Main plant room commissioning and training on main boiler functionality
- Turnkey project management for the installation of the proposed system
- Full 5 year warranty on all parts and work completed

## District Heating System

All trenching works are to be completed by a specialist trenching team to complete the following:

- Design of the underground heat distribution network
- Supply of district heating pipe and joints (on the assumption of 56 meters of trenches being dug)
- All trenching works and laying of district heating pipes
- District heating interface, controls, valves and commissioning sets to connect into the main plant room

## District Heating System

- Conduit between the packaged plant room and greenhouse for electrical cables, by others
- Jointing and testing equipment, provision of shrouds and insulated sleeves (joining to be completed by specialist trenching team)
- Filling, testing and commissioning of district heating system
- All trenching, pits, spoil, infill and making-good of surfaces is the responsibility of the client

## Heater Units in the Glasshouse

- Supply 4 Low Noise Heaters & 4 x 40kW Comfort Vertical Heaters & 2 x over door heaters
- Installation of the above items & pipework, controls and power to all heaters
- Connection to district heating system
- All valves, pipework and fittings associated with the heaters
- Suitable electronic controls supplied
- Commissioning of the system

## Description of Works

**Packaged Plant Room Building Works**

- Deliver specified equipment to site and completion of all works as detailed above
- Liaison with Building Control to ensure new structure complies, and sign-off
- All equipment and labour to complete work

**Packaged Plant Room Equipment Installation**

- Deliver equipment to site, off load and position heavy equipment, and assemble all items
- Install and plumb 2 no. biomass boiler into bespoke plant room and wood store
- Install and fit 1 no. agitators and auger arrangements
- Fit above specified flue systems from boiler up through roof to ridge height to comply with Building Regs
- Supply and install all plant and down stream heating pipework to the supplied buffer tanks and allow for connection to the underground pipework
- Install buffer tanks and expansion vessels
- Connection of underground distribution pipework to main plant room system—laying and trenching by others

# Description of Works

- Provision of 230V supply into plant room to local isolators for onward connection.  All lighting and power sockets in plant room to be supplied
- Provision of water supply to boiler room by others & insulation and labelling of all pipes

**District Heating Installation and Groundworks**

- All trenching works to be completed by client
- Complete all necessary District Heat Pipe Joints
- Installation and connection of district heating pipes to main plant room and greenhouse

**Completion**

- Provide water and electricity supply to Plant Room
- Pressure test Plant Room and District Pipe Work
- Fill system with water and water flush
- Fire boiler, bring to temperature and run system
- Drain system and re-fill with system inhibitor and water
- Open connection to existing heating zones and run each system
- Commissioning of biomass boiler plant and supply of certificate of compliance
- Provide training and handover manual to include hydraulic and wiring schematics and user manuals

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**Bio Global Industries Ltd**

Hunters Oak, Asheridge,

Chesham, Bucks, HP5 2UU.

T: **01494 757055**

E: **info@b-g-i.co.uk**