

## Appendix 10: Energy Efficiency

### Energy usage at Red Hall Farm

Energy source	Use
Electricity	Lighting, ventilation, computer control systems, feed augers, water pumps
LPG Gas	Hot water boiler/Brooders
Diesel	Standby generator, jet wash and vehicles.
Biomass Fuel	Hot Water Boiler
Kerosene	Hot Water Boiler

### Heating

The correct environment for the birds is maintained in the sheds through a combination of Hot Water radiators located within the house and ventilation fans located in the roof of the houses and at the end of some houses, see site layout plan Appendix 1.

Each shed is monitored by a computer system, which automatically controls and records the humidity and the temperature.

Hot Water will be provided by two 950 Kilowatt clean biomass boilers in all the houses, this will be backed up by four 100 kilowatt LPG boilers in the 'A' houses and by a 1200 kilowatt Kerosene boiler in the 'B' houses

Hot Water radiators are equally distributed though the housing to prevent cold spots and sensors triggering and activating the heaters unnecessarily.

Control sensors are checked regularly and kept clean so they are able to detect the temperature at the stock level.

Ventilation rates are computer controlled to minimise, as far as the indoor requirements allow heat losses from the sheds.

Fans are fitted with back draft shutters to reduce heat loss.

The sheds are maintained in good condition, cracks and open seams are repaired.

The sheds are fully insulated with a U-Value of approximately  $0.4 \text{ W/m}^2/\text{°C}$  to reduce condensation and heat lost.

The sheds are constructed to ensure litter is dry and friable and reduce the need to heat the sheds to keep the litter dry.

The concrete flooring is maintained and cracks are repaired.

Each shed has a damp proof course.

Cupped nipple drinking system reduces spillage of water.

### Electricity

The ventilation fans in the houses were selected so that they are appropriate power and size for the sheds.

The computer control systems control the ventilation for maximum efficiency ie one fan operating at full capacity rather than two operating on half their capacity.

The fans are low energy per m<sup>3</sup> of air.

The fans are regularly maintained, and cleared of debris.

Low energy light bulbs are used in the control/vestibule areas, the office and stores.

Fluorescent lights are used in the sheds.

We do operate a variable lighting period during the crop cycle.

### **Fuel Oil**

The standby generators is regularly maintained in accordance with the manufacturer's instructions to insure it operates efficiently.

### **Biomass Boilers**

The Biomass Boilers will be regularly maintained in accordance with the manufacturer's instructions to insure it operates efficiently.

### **Kerosene Boiler**

The Kerosene Boiler will be regularly maintained in accordance with the manufacturer's instructions to insure it operates efficiently.

The farm has already undertaken 2 four yearly energy reviews.