

Increase boiler efficiency with an economiser

The use of wood-waste as fuel to heat factories in the furniture and wood processing industries is nothing new, There have however been advances in design that have led to greater efficiency in the use of wood as a fuel.

Modern boiler design, with conventional-fuelled boilers, has led to a new generation of oil and gas condensing boilers. They are called condensing boilers as they take the flue temperatures so low that water vapour can be seen issuing from the flue often with a plastic flue system.

Whilst it is not possible to do this with a wood fired system the efficiency of a boiler can be greatly increased by the use of an economiser. The economiser is a separate or integrated heat exchanger that takes the exhaust flue gasses from a boiler and then passes them through another two passes in a heat exchanger to extract more of the heat from the flue gasses.

The economiser typically reduces the flue temperature by over 100°C giving increased efficiency. The increase in the use of economisers has been driven by Government legislation and grants and incentives to encourage



the use of biomass as a source of heat. If companies are buying in fuel then the user needs to obtain maximum return on the fuel bought.

Grants have been awarded under the DECC Bio-energy capital grants scheme – to qualify for the grants a

high efficiency is required. The Renewable Heat Incentive or RHI also requires high efficiency from the boilers on the scheme to receive payments under the RHI.

Economisers are available to fit to existing installations to increase out-

Below: 150kW Ranheat boiler with economiser mounted on top

Right: Rear view of economiser

Opposite page top: Economiser fitted to a 600kW boiler

Opposite page bottom: 600kW boiler and economiser during installation





put and efficiency.

The return water from the system is passed through the economiser before being re-circulated through the boiler.

The economisers are fitted with hinged cleaning doors at the front and cleaning accesses at the rear for ease of maintenance, which consists mainly of keeping the tube nest clean for better heat transfer.

The other advantage of the economiser is that all of the components after the economiser run at lower

temperatures such as the flue gas cleaning equipment and chimney fan.

Economisers can be manufactured and installed to fit most makes of boiler. Some older boilers typically run with flue temperatures of 350°C. With a well-designed economiser this can be brought down to the low 100s. It also results in a much cooler environment in the boiler house.

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Resources from waste, clean energy cash back – now the woodworking industry can benefit

The renewable heat incentive or RHI was announced in 2009 by the Government. In the latest discussion document it was described as “clean energy cash back”. The scheme is due to start making payments to users from April 2011, although equipment installed from July 2009 will be eligible.

So how will this affect the woodworking industry and readers of Furniture Production? The proposal is, in a nutshell, to pay companies to produce their heating using biomass. For our industry this means wood.

The proposal is to pay companies an agreed subsidy for every kW hour they produce of useful heat to heat their premises. At the moment the rate is due to be set at 6.5p per kW hour on plants up to 500kW.

As an example, if a company has a gas bill of £10,000 and is paying 4.0p per kW hour they have a usage of 250,000kW hours. If this was replaced with energy derived from wood you save the £10,000 in gas costs and would receive payments under the RHI of £16,250. The RHI payments will be guaranteed for 15 years provided the equipment is in use during that time.

Let us also consider the recent changes in Landfill Tax: “Raising the tax by £8 per tonne per year to £48 by 2010 for ‘active’ waste will make a whole range of waste treatment technologies financially viable – for all wastes, not just municipal. The three-year plan for the escalator is good, too. Businesses need time to change and even the anticipation of a £48 per tonne tax – plus steadily increasing landfill gate fees – will be enough to influence many waste and resource management decisions.” says Steve Lee, chief executive at the Chartered Institution of Wastes Management (letsrecycle.com).

“Any increase in the Landfill Tax as far as the wood recycling sector is concerned has to be a good thing. A lot of wood is going to landfill and it needs to be diverted to feed growing demand from board mills, biomass, animal bedding and potential demand for woodchip from overseas.”

The £48 per tonne Landfill Tax is in addition to the bin hire and transport costs that waste contractors will also charge. So let’s consider a company that currently has three tonnes a week of wood-waste going to landfill at say £100 per tonne. If we add this for 50 weeks of the year we have a disposal cost of £15,000.

Add these three factors together and you have annual savings on heating, disposal and RHI income that amount to £41,250 per year, so over 15 years a saving of over £600,000.

The woodworking industry has a distinct advantage in that often large amounts of good clean dry wood are already available on site to provide heating for the factory and offices.

Based on all of the above do we still want to call it wood-waste? Think of it as wood resources, start utilising it and start saving and making money!

The final details of the RHI are yet to be completed but at the outset it looks like a scheme that the woodworking industry should embrace with both arms.

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