Biomass heats award-winning Welsh hotel

Tre-Ysgawen Hall Hotel is an award-winning luxury spa and hotel scenically set in rolling countryside on the Isle of Anglesey, Wales. Originally built in 1882 as a country mansion it opened as a hotel in 1996 after it was acquired by Rowlands, a former operator of the Rees Arms Hotel in nearby Menai Bridge.

The new biomass boiler system uses about 450 tonnes of woodchips per annum. The woodchips are supplied from a local depot by Stobart Biomass Products Ltd, a subsidiary of Stobart Group, a leading UK infrastructure, logistics and support services company. The running costs are around GBP 40 000 (≈ EUR 56 000) per annum, less than half the amount the hotel was spending on fuel oil. However with the non-domestic Renewable Heat Incentive (RHI), a government financial support scheme that provides regressive payments based on the actual heat output, the estimated payback time is within six years.

– It’s not like spending it on the refurbishment of rooms or on new carpets – and customers were not going to see the benefits of this large amount of money. However with the non-domestic Renewable Heat Incentive (RHI), a government financial support scheme that provides regressive payments based on the actual heat output, the estimated payback time is within six years.

Text: Alan Sherrard
Photos courtesy Rural Energy
BB1/14928/AS

Boiler and Burners Directory

Despite two mild heating seasons in a row, at least in Europe, now is a good time to take stock of upcoming heating needs and emissions legislation requirements. According to a recent market research report published by Transparency Market Research (TMR), a global market intelligence company, the global biomass boiler market is expected to grow “healthily” at a CAGR of almost 20 percent during the period from 2014 to 2022. Entitled “Biomass Boiler Market – Global & UK Industry Analysis, Size, Share, Growth, Trends and Forecast 2014 - 2022”, the TMR report estimates the global biomass boiler market, segmented as residential, commercial, and industrial, was worth US$1.8 billion in 2013. It is forecasted to reach a valuation of US$9.8 billion by 2022. The commercial sector was the major end-user of biomass boilers in 2013 and is expected to dominate the market in the near future. As expected, heating was found to be the largest application of the market in 2013, accounting for around 80 percent. Of the three boiler types, bubbling fluidised bed (BFB), circulating fluidised bed (CFB), and stoker boilers, the latter dominated the market in 2013 and is expected to account for the highest market share during the forecast period. Woody biomass was the largest feedstock type for power and heat generation in 2013, accounting for around 78 percent. The other 22 percent of the feedstock categories – agriculture and forest residues, biogas, and energy crops, urban residues and others including landfill gas – made up the balance though it should be noted that boilers tend to be feeding fluidised beds.

The report points out that the rapid industrialisation in developing economies such as India, China, and Brazil has fuelled the demand for energy and this is expected to augment the growth of the global biomass boiler market. Enforcement of boiler standards and with the Renewable Heat Incentive (RHI) in the UK, will boost the growth of the overall market during the forecast horizon. On the flip side the report mentions that the challenges related to biomass fuel supply, storage, and handling will hamper demand for biomass boilers.

The purpose of this biomass “Boilers and Burners Directory” is to provide an overview on those who can supply biomass conversion technologies for larger residential, commercial or industrial applications. Note while the list is comprehensive it is not exhaustive nor does it in any way represent an endorsement of a company and/or product.

Text: Alan Sherrard
BB1/15013/AS
Bioenergy on the ground

Whilst much focus for the aviation sector is on reducing aviation emissions in the air, a lot can be done on the ground.

One aircraft manufacturer major, Airbus Group, has reduced carbon dioxide (CO2) emissions from its assembly plants in France by switching to biomass heating.

EMPLYING OVER 10,000 STAFF IN 350,000 m² OF COVERED SPACE, THE Airbus Industries Cité Aer-amy assembly facility in Toulouse, France is an enormous workspace. Here several different aircraft models, from the A320 up to the Primus AS38 are assembled. In 2010 a decision was made to overhaul the heating needs and environmental impact as part of the Group’s overall long-term “eco-efficiency” commitment. This includes in “Blues” target to reduce total carbon dioxide emissions by 50 percent in 2020 compared to 2006. The choice was to install an 11.5 MW woodchip fired steam boiler from Austrian ventilation and combustion technology specialists Polytechnik Luft- und Feuerungstechnik GmbH. The project received investment support from the French Environment Agency, ADEME, and is the first biomass installation at an Airbus facility.

The compact boiler plant houses three fuel bunkers equipped with a crozé grapple. Each bunker has a moving floor to meter out fuel to the boiler and can hold roughly one day’s worth of fuel. A special feature is an emergency-running by-pass enabling safe shutdown of the boiler should a disruptive shutdown in the gas heating occur and threaten to affect the biomass feed.

The flue-gas cleaning system consists of a multi-cycle followed by an electrostatic filter that removes particulate matter (PM) down to the 2-8 mg/Nm³ range under normal operating conditions, well below the legislative limit of 20mg/Nm³. Other regulated emissions such as nitrogen oxides (NOx) are well below 200 mg/Nm³, less than half the 400 mg/Nm³ limit, whereas carbon monoxide (CO) and sulphur dioxide (SO₂) are almost undetectable.

The resultant ash from the combustion process is, after appropriate treatment, used as a fertiliser in agriculture.

Process steam and heat plant orders for URBAS

Austrian boiler fabricators URBAS Maschinen- und Anlagenbau GmbH report a busy order period for its biomass-based boilers having received several orders in different markets. In Sweden an order for a 10 MW, 18 bar process steam plant including building work was received from mechanical pulp producer Wägberg Cell AB, a subsidiary of ATPA Group. Delivery is scheduled during late 2016.

In Norway an order for a 5 MW hot water boiler with buildings and delivery by end of 2015 was received from sawmill group, RingMøn Tan AB. In Estonia an order was received from Finnish forest products group UPM for a 20 MW process steam boiler and building for its Opaõja sawmill factory with delivery during late 2016.

Much closer to home is an announcement from Austria’s largest hearth unit KELAG Wärme GmbH that it will establish a district heating plant in Villach, where URBAS is based. KELAG has placed an order for a 4 MW plant, which is to be operational by the end of the year.

derately. However according to Polytechnik the hydraulic grate boiler can handle longs, fines and moisture content from 20 to 55 percent with the key to trouble-free boiler operation attributed to proper staff training and constant monitoring of the thermal output of the plant.

Ash recycling

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First industrial “dual-pellet” boiler commissioned

Lithuanian-based biomass combustion technology specialist Envernia has announced successful commissioning of its new “dual-pellet” steam boiler in Klaipėda, Lithuania. The 2 MW plant is designed to use straw and/or wood pellets as fuel. Internationally known Philip Morris Klaipėda, a tobacco processing facility, the boiler reduces the use of fossil gas. Operating at 10 bar, the boiler has a nominal capacity of 3 tonnes per hour of dry, saturated steam with an output adjustment of the nominal capacity from 30 percent upwards. Available in the 1 to 5 MW thermal capacity range the straw pellet boiler is, according to Envernia, 10 to 15 percent more expensive than a wood only version but can use wood pellets as well enabling fuel flexibility depending on availability.

– This is another of our Lithuanian innovations we are proud of. The use of biomass such as straw for industrial energy production is completely feasible and cost effective, said Virginijus Ramanauskas, CEO for Envernia in a statement.

Woodroll on a roll in Japan?

Swedish biomass gasification technology developers Corus Energy AB has announced it has signed a Letter of Intent (LoI) with an unnamed Japanese company to supply its proprietary WoodRoll technology to a proposed biomass power project. The Japanese client has announced successful commissioning of its new “dual-pellet” steam boiler in Klaipėda, Lithuania. The 2 MW plant is designed to use straw and/or wood pellets as fuel. Internationally known Philip Morris Klaipėda, a tobacco processing facility, the boiler reduces the use of fossil gas. Operating at 10 bar, the boiler has a nominal capacity of 3 tonnes per hour of dry, saturated steam with an output adjustment of the nominal capacity from 30 percent upwards. Available in the 1 to 5 MW thermal capacity range the straw pellet boiler is, according to Envernia, 10 to 15 percent more expensive than a wood only version but can use wood pellets as well enabling fuel flexibility depending on availability.

We are very pleased with this interest from Japan, a country with a pressing need to replace fossil and nuclear energy while it is also the global leader in fuel cell technology and applications. The high hydrogen content of WoodRoll means a unique position for the future to create the next generation of competitive renewable energy solutions based on WoodRoll and fuel cells, said Rolf Jürgen, CEO of Corus Energy, in a statement.