

New energy crops trial could be the finest in Europe

Changes afoot

There are early signs of storm clouds brewing on the horizon of the UK biomass heating industry. The government's Renewable Heat Incentive (RHI) has given the sector a great deal of momentum but the very high tariffs offered have meant that most of the low hanging fruit has already been picked. So far 9,072 biomass installations have been accredited under the non-domestic scheme and 4,800 under the domestic scheme.

As a result of the RHI's popularity, a number of things have happened. Firstly, the tariffs have been reduced (or degressed) significantly. Before 1 July 2014, the installation of a small biomass (<199kW) system would have benefitted from a Tier 1 (for the first 1,314 hours of boiler use) tariff of 8.94p per kWh of eligible heat generated. Since then there have been four depressions and the current Tier 1 tariff now stands at 5.87p/kWh – a 35% reduction. This means a user installing 199kW system a year ago would be around £8,500 per year better off compared to a later adopter in 2015 (based on 1,650 hours use per year). This is highly significant and in most cases will increase payback times by about two years. The small biomass Tier 1 tariff is likely to be further reduced by 25% to 4.4p/kWh on 1 July.

At the same time as these depressions, the price of oil has dropped and the cost of bought in woodchips and wood pellets has risen. Both are detrimental to the economic attractiveness of a project.

Most biomass boilers are imported from the continent. Thankfully, the current weakness of the euro against the pound means that kit prices are being kept reasonably low. However, this might change overnight by external events, for instance if financial markets get jittery

following the UK election. Furthermore, the amount of projects that are underway has not reached a threshold which enables ultra-mass marketing and a reduction in boiler prices. By contrast, the surge in solar photovoltaic installations resulted in capital costs coming down as Feed-in Tariffs (FITs) were degressed. Again, as most boilers are produced in rich western European countries with high employment costs, the prices are likely to remain stable or even increase.

Feedstock flexibility

All this would suggest that biomass boiler installations (especially in the non-domestic sub 199kW category) are becoming less attractive. Might the biomass heating bubble be ready to burst?

Possibly, however one of the best ways to improve the lifetime economics of a biomass project is to use cheaper fuel. This can involve using residues, chips produced from farm woodlands, or purpose grown energy crops. Self supply scenarios are still comparatively rare but there is certainly some appetite, particularly amongst farmers and land owners towards cutting out the middle man.

There are many self supply options including cereal straw, miscanthus, short rotation coppice (e.g. SRC willow and poplar), and short rotation forestry (e.g. SRF eucalyptus). It is possible to produce these for around 20-40% of the cost of bought in woodchips. In addition, by producing your own you are more likely to be insulated against any future price hikes. This is because the amount of fossil fuel required to harvest and transport self supplied fuel is minimal. Bought in woodfuel, which might be moved hundreds of

kilometers, will be subject to much greater price fluctuations.

For those that can grow their own fuel as well as those that have to buy from elsewhere, what is needed is a feedstock flexible boiler. For those buying in it would be highly beneficial if they could pick and choose their fuel based on what is available locally at a low price.

The Austrian manufactured Biokompakt boiler fits the bill. This boiler range can burn many types of biomass and has a novel triple fuelled augering system which enables users to mix and match a variety of different fuels at once. There is also an integrated lime dispenser that reduces the corrosive nature of fuels with a low pH (high acidity) such as straw chips or cereal grains.

The Biokompakt range is distributed in the UK by Bio Global Industries (BGI) based in Asheridge, Buckinghamshire. The company's headquarters is fuelled by a 98kW system fed from three separate fuel stores. The typical feedstocks are self-supplied SRC woodchips, bought in wood pellets and bought in arboricultural arisings. However, BGI has trialled raw woodchip (50% moisture content), dried wood shavings mixed with animal manure and dried grass clippings. In each case the boiler has achieved high efficiencies and low emissions below the thresholds for particulates (30g/GJ) and nitrogen oxides, or NOx (150g/GJ).

BGI is currently establishing a comprehensive trial of perennial energy crops in Europe involving:

- Thirty SRC willow varieties produced from four different breeding programmes in the UK and Sweden
- Fifteen poplar varieties bred in Begium, Germany and Italy
- Two eucalyptus strains of *E. glaucescens* originally sourced from Australia

- *Sida hermaphrodita* (also known as Virginia fanpetals) from Poland
- *Micanthus x giganteus* from the UK
- Four varieties of reed canary grass (*Phalaris arundinacea*) bred in Sweden
- Two varieties of Switchgrass (*Panicum virgatum*) bred in the US
- Various high yielding bamboo species.

BGI's MD Matthew Hunt says: 'Once mature our plantations will comprise one of the most comprehensive collections of perennial energy crops not only in the UK but the whole of Europe. The Biokompakt boiler range is truly multi fuel. It can use around 30 different types of biomass and up to three simultaneously. There is the possibility that the boiler will be able to use over 100 different fuel types in the future as the industry matures. There are masses of agricultural residues that have no market (such as linseed straw) and other waste streams that currently end up in landfill that could be used. For instance, the UK's love affair with coffee means that there is a huge amount of waste coffee grounds. These can be pelletised and used in our boilers. This provides dual benefits – the potential to reduce waste disposal costs whilst producing clean and green heating energy.'

He continues: 'We want our prospective clients to know all their fuel options, whether they are agricultural residues or waste streams that are available locally or the potential of growing their own energy crops at all scales. Our Biokompakt range will be less affected by RHI tariff depressions as its multifuel versatility means that end users can shop around for cheaper fuels or produce their own from the energy crop that suits their land and facilities.'

Challenges

Using alternatives to woodchips and pellets is not all plain sailing, however. In order to qualify for RHI payments a boiler must have an RHI emissions certificate showing that the boiler can meet the thresholds for particulates and NOx with the fuel that it is using. This can be expensive for boiler manufacturers and indeed many brands that claim to be able to use herbaceous fuels have not gone through the testing procedures as a result of the cost.

The Biokompakt range has developed over a 30 year period. Ernst Gerlinger, the founder of the company has constantly striven to improve the product, adding more components to achieve higher combustion efficiency and increase fuel flexibility. Currently, Biokompakt is close to being the first company

that has managed to get the boiler accredited to burn Class E biomass. This will mean that all fuels in this class such as miscanthus and straw will be eligible for RHI payments.

Another issue involves the sustainability criteria that RHI participants and fuel suppliers must adhere to from 5 October 2015. In 2013 the Department of Energy and Climate Change (DECC) commissioned the setting up of a Biomass Suppliers List (BSL). The idea was that all suppliers would need to comply with sustainability criteria (minimum thresholds for lifecycle greenhouse gas emissions and land criteria) to get on the approved list and end users would need to source their fuel from this list. Self-supplier users would be exempt but would need to sign up and self-report.

Unfortunately, the BSL as it stands only includes woody biomass (e.g. woodchips,

pellets, SRC, waste wood) and is not inclusive of straw or miscanthus or other fuels such as cherry pips. As a result of this oversight there is a requirement for a non-woody BSL to be set up in a very short timeframe.

BGI is supporting an industry-funded approach to this (led by Crops for Energy and the Farm Energy Centre) which will require annual payments from suppliers and end users. On the face of it this seems unfair (as the woody BSL is free to suppliers and users. However, DECC has indicated that, when the current BSL contract expires, it expects the industry to pick up the tab for this as well. It is hoped that the non-woody BSL is ready in time for the October deadline but even if this is not the case then end users can self report to Ofgem and get their own independent audit done.

Hunt explains why he is not unduly worried about this: 'In

the early days of the RHI most of the installations involved woodchips, pellets and logs. In some ways the government could be forgiven for omitting herbaceous crops as so few of the applications involved this type of fuel. However, the depressions have moved the goalposts and we are convinced that many more people will be looking to these cheaper fuels. So a non-woody BSL is inevitable and is certain to be available sooner rather than later.'

In any case, BGI has its sites firmly on the post-RHI landscape when the market is mature enough to survive without subsidy. 'When we get beyond the RHI people will be looking for the best quality boiler and it's capability for burning cheap fuels. We're already ahead of this curve,' Hunt concludes. ●

For more information:

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