British Renewable Heat Policy - Investing in Industrial Bio-energy

By Richard Gueterbock, Marketing Director, Clearfleau Group Ltd.

Summary

Should the British Government be seen to be helping British businesses to enhance their competitive advantage prior to Brexit? Also, with global progress towards more effective resource use, should policy support the transition to lower carbon manufacturing? Why is the opportunity for on-site, decentralised energy generation being championed in Scotland but not by politicians in Westminster and Whitehall?

Efforts of British industry to deploy innovative bio-economy and energy solutions to facilitate industrial decarbonisation and adopt low carbon manufacturing solutions are being undermined. The premature removal of incentives for bio-energy generation will halt investment in the development of sustainable technology solutions, undermining the ability of British companies to compete in a global marketplace.

Bio-energy solutions including anaerobic digestion (AD) have an important role to play in decarbonising food and drink processing sector, cutting water use and energy consumption. Manufacturers must also manage water and other resources more efficiently. On-site biogas generation can facilitate grey water re-use and carbon capture, enabling manufacturers to access the latent energy content in bio-residues.

While the bio-energy industry must show that it can enhance wider resource efficiency to justify a future after losing the current incentive payments, it is also disappointing that both the FIT and RHI regimes are being wound up prematurely. This without a future strategy in place for the stimulation of industrial decarbonisation. However, with sustained support from Government, clean energy (as part of the bio-economy) can help create a more holistic approach to curbing the impact of industry on climate change.
Introduction

One consequence of the Brexit-related industrial policy vacuum is that industry lacks clarity on how the Government plans to motivate business to generate renewable heat and embrace the transition to a lower carbon economy. Under the proposed Customs Arrangement plan, if UK companies are to retain EU market access, they will still have to match EU standards. This must include future EU commitments to sustainability, renewable energy, low carbon heat and the wider bio-economy.

With our German partners, EnviroChemie GmbH, Clearfleau has better access to opportunities in the European industrial bio-energy sector. However, we also require an active British market for resource efficient bio-energy and water management solutions. Wider development of novel technology in the industrial bio-tech and bio-energy sector is a strategic sector, which the UK should be fully part of.

A move to more sustainable manufacturing and a circular approach to resource use is being driven by the major multinationals setting their own goals and targets, way ahead of the SME business sector. The UK must develop the bioenergy engineering sector, as part of an integrated solution to industrial emissions reduction. SMEs involved in the wider global supply chain will improve their own competitive advantage if they can support the drive by the larger multi-nationals to decarbonise their supply chains.

Decentralised Bio-energy

Clearfleau is developing bio-energy projects with global food and beverage companies including dairy companies (inside and outside the EU), a rum distiller and a glass manufacturer. However, reducing carbon emissions over the long term depends on the UK finding solutions for many smaller businesses that should be the drivers of growth in the post-Brexit economy. Uncertainty about the future shape of Britain’s trade relations is matched by indecision on how to reduce industrial emissions on SME sites.

On-site bio-energy solutions, whether based on AD, biomass combustion or more advanced thermal technologies, can generate decentralised energy from process residues and manufacturing wastes on industrial sites. While large-scale power generation will always have a role to play, more industrial sites will see the value in decentralised on-site, low-carbon energy. This is already being championed by the Scottish Government as part of strategic integrated policy initiatives supporting Scottish businesses.

Companies are showing increasing interest in generating value and energy from liquid and solid process residues, including from smaller dairy, meat, vegetable and fruit processing sites. The challenge is to provide an attractive payback, once the current renewable energy incentives are no longer available. Most of our industrial clients require paybacks under five years (which is quicker than many renewables projects) and we have already started work on projects where this may be possible without incentives.

However, some form of incentive is required for the transition to low carbon heat generation on smaller industrial sites but delays over the reform of the RHI have set this back by about two years. The current RHI incentive regime for renewable heat and power should be extended beyond the 2020 cut-off date for smaller (under 1MW thermal) decentralised bio-energy systems that can supply low carbon heat and
encourage carbon efficiency on smaller industrial sites, as well as reducing fossil fuel use in rural areas. Extending the RHI regime by six months would ease the transition to any new policy initiative.

**Drivers for the Bio-economy**

Apart from escalating costs and pressures for carbon reduction, other factors, including the need for improved water efficiency and the recent carbon dioxide shortage, are encouraging food companies to explore how industrial bio-technology and bio-energy can support the resource efficiency transition.

On-site AD can also facilitate grey water re-use. While normally our biogas plants discharge water to a nearby watercourse, it’s a short and relatively simple step to allow for re-use in the factory. As the food sector becomes more conscious of its water footprint, on-site AD will become part of the solution.

Water is not the only commodity where concerns have been raised about shortfalls in supply. A carbon dioxide shortage recently hit retail supplies of meat, carbonated drinks and beer, plus many other food products, for instance crumpets. Among the co-products of AD is carbon dioxide (CO₂ - over 30% of the gas content of methane). At present CO₂ being extracted from biogas on a number of AD plants is not used. This CO₂ could be used to replace imported supplies (by-product of artificial fertiliser production).

The biogas industry must not only reduce atmospheric release of CO₂ but also convert industrial carbon emissions into useful industrial grade CO₂ for use in the food supply chain. BEIS wants to discourage the use of feedstocks like grass or maize in AD plants. Some plants currently add to rural carbon emissions (alongside the methane generated by herds of beef or dairy cows). Requiring biogas production to be carbon positive would help ensure better use of all the content of biogas rather than just the methane.

*Clearfleau is working with EnviroChemie on modular designs*
Bio-residues can be converted into on-site bio-energy, with clean water and carbon dioxide for use in the factory. Residual nutrients from AD can be used to provide fertility to the crops that are processed in the factory or fed to the livestock that produce meat and milk - both of which have a high carbon and water footprint. Residues have less environmental impact than crops like maize or grass, if used for AD.

Energy supplies alone will not justify the future role of anaerobic digestion in the bio-economy. We need to show that all the outputs from AD plants, as well as the heat and electricity have a use. Not just clean water but also recycled CO₂ (and other trace gases) and residual nutrients (nitrogen and phosphorous - the latter will soon be in short supply) should have a greater value in the more circular economy.

**Future Bio-energy Policy**

AD and other advanced bio-energy solutions not only offer a decentralised energy source but can also contribute other fuels such as methanol and hydrogen, plus novel ingredients that could be part of our food supply chain. The bio-energy industry needs to look at how it will fit better into the more circular economy and support efforts to make better use of all our natural resources. Should more be done to discourage crop only, carbon-emitting AD plants as part of decisions on future support for bio-energy?

We need leadership, not just from Government and the EU institutions, but also from industry bodies like the REA and ADBA and food sector trade associations. We should promote bio-energy as a part of a holistic solution to the issues of climate change and emissions reduction - by ensuring that it is not just the biogas we value but also nutrients and clean water that are its by-products. A key factor should be the inherent carbon efficiency of the process. I will be repeating this message the RWM (Recycling and Waste Management) event – see [www.rwmexhibition.com/theatres/circular-economy-theatre](http://www.rwmexhibition.com/theatres/circular-economy-theatre), taking place in September but it is an issue that must be discussed with BEIS and Defra.

A serious concern is the extent to which climate change deniers are holding the levers of power in the US and in an increasing number of developed nations. In the UK, ardent political support for isolationist policies can be matched by indifference to concerns over the future of our planet and the damage done to our environment. Even if some politicians do not buy into concerns over climate change, it is simply not acceptable practice to waste natural resources and add to the burden on the global environment.

We need to support Ministers and their policy advisers in the development of future policy to replace the Feed in Tariff and Renewable Heat Incentive (RHI). Also, it is a mistake to wind up both incentive regimes without having a future strategy in place. Is it out of the question for BEIS to delay the demise of the FIT regime to coincide with the end of the RHI? Or could the RHI be extended beyond the current end date in January 2020, to compensate for the unreasonable 2 year delays to the reforms?

Ministers in BEIS and DEFRA should listen to British bio-engineering companies that are offering carbon-efficient technologies but also indicate how they will support investment in decentralised bio-energy on factory sites to replace fossil fuels and, as in Scotland, put this at the core of future energy strategy.
Here are some ideas could be developed by BEIS as part of plans for decarbonising industry, post RHI:

1. Engagement with the EU pre-Brexit to coordinate an industrial policy framework for low carbon manufacturing solutions, so that British engineering businesses can continue to trade and play a leading role in the future development of low carbon technologies, within the EU and globally.
2. Bring forward ideas for policies that will help British industry - from brewers to cheese makers and aviation to glass production - to embrace the circular economy, to find effective ways to cut emissions using existing technologies, while developing more innovative bio-energy solutions.
3. Extend the current incentive regime for renewable heat and power beyond 2020, for smaller scale decentralised bio-energy systems that can demonstrate they are supplying clean energy and carbon efficiency on smaller industrial sites as well as more remote rural communities.
4. Recognise the role of bio-energy as a more sustainable solution to the provision of low carbon fuels, with policy support for clean renewable heat and vehicle fuel alongside green electricity.
5. Support efforts by farms and rural businesses to develop low carbon transport options for rural areas and develop new sources of fuel for farm tractors and HGVs that transport food products.
6. Development of a carbon emissions-based incentive regime for the business sector, in particular for SME businesses, but that could also support farm energy and community energy schemes.

Existing and novel renewable energy solutions can help meet heat and fuel demand with decentralised supplies for rural communities and food businesses. Factories can supply on-site energy from residues. Farms can supply bio-energy plus wind and solar power as outlined in the “Refuelling the Countryside” report on the farm as a source of energy produced by the Royal Agricultural Society of England (RASE - http://www.cenex.co.uk/wp-content/uploads/2014/06/RASE-Re-Fuelling-the-Countryside.pdf)

The biogas sector will shift its focus away from relatively inefficient use of CHPs for electricity generation to providing a source of clean heat on industrial sites and in rural areas and fuel for trucks or commercial activities. This should extend across the food supply chain as part of our national decarbonisation goals.

**Conclusion**

There is a future for AD as a low carbon energy source on a smaller scale: on-site generation of power, plus low carbon heat or fuel solutions for farms, food production sites and rural communities. Transition from the current RHI/FIT regimes should be away from often inefficient, larger sites to multiple smaller bio-energy solutions, better able to utilise local organic resources, while supporting jobs and the local economy. This requires an interim framework for smaller bio-energy solutions to fill the policy vacuum.

An indication from Ministers on how to stimulate development of decentralised bio-energy on factory sites to replace fossil fuels would be welcome. This must be the core of UK industrial strategy, working with British engineering companies to develop a framework for low carbon manufacturing and leading the development of applied bio-energy technologies. Hopefully Government Ministers recognise that British SME businesses need help to cut their factory emissions and embrace the circular economy.