



18 March 2014



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Tuesday, March 18, 2014

UK Bioenergy: Are Dedicated Biomass Plants a Bust?

Despite the UK government's oft-stated renewable energy ambitions, investors are walking away from dedicated biomass projects as inconsistent and far less ambitious policy decisions begin to affect sentiment.

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LONDON -- As Ed Davey, U.K. Secretary of State for Energy & Climate Change, spoke to the Environment Council in Brussels, saying: "We call for urgent action on reaching an ambitious 2030 energy and climate change agreement, to spur on investment in green, reliable energy," at home in Britain the backers of a flagship biomass energy project announced that it would be economically unfeasible to continue development. What happened?

When U.K.-based independent developer RES announced that it would be ceasing work on its £300 million (US\$500 million) biomass power station project at the Port of Blyth in Northumberland it cited on-going uncertainty in U.K. energy policy, prompting the withdrawal of a key project partner in late 2013.

In a statement RES said that the government's inconsistent support for dedicated biomass energy as well as increased uncertainty in regard to the Electricity Market Reform (EMR) process had critically undermined the investment case.

The company argues that biomass has "been increasingly marginalised by the U.K. government in a series of policy developments over the last two years, including the introduction of a cap on dedicated biomass under the Renewables Obligation (RO)." RES says the cap "represents a radical downsizing in government ambition for the technology from a target of 4,000 MW in 2011 to a cap of 400 MW in 2013, long after the industry had invested significant sums in developing projects on the back of DECC ambitions."

"In addition, the government's preference for the conversion of existing coal-fired power stations to biomass over dedicated biomass generating capacity is at odds with the urgent need to bridge the looming capacity crunch in the UK energy system."



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However, despite RES' assertions, it is evident that conversion from coal to biomass is not necessarily a route to commercial success in the U.K.'s energy market. Last August [RWE npower announced that was to close its Tilbury Power Station](#), which finally shut down in October 2013.

This 1960s-built coal-fired plant had been converted to fire biomass in 2011 as the European Commission's Large Combustion Plant Directive (LCPD) — which mandated either a significant upgrade investment in emissions reduction or a limited number of operational hours for older coal-fired installations — began to bite. For Tilbury B, RWE determined that it would use up the remaining operating hours by switching to biomass in the hope that the move to low-carbon generation would garner support for continued operation post LCPD, potentially with another decade or so of service life.

Operation of the plant on biomass pellets — more than 90 percent of which were sourced from North America — resulted in greenhouse gas savings in excess of 70 percent over coal at the 870-MW plant.

However, the government reportedly declined its bid for inclusion in the Contract for Difference (CFD) pricing mechanism that will support renewable generation following introduction of the EMR measures. As a result, given the investment required to modify and refurbish the plant to bring its thermal efficiency up to the required 37 percent minimum standard for new biomass-fired plant, RWE said the plant was "no longer economically viable."

Another factor possibly contributing to the decision was a February 2012 fire in the biomass fuel storage area that saw the station offline for four months.

Of course, there are those who argue that allowing wheezing and ancient coal-fired plants to eke out a few more years of life on biomass is the wrong approach. Certainly, a modern, dedicated biomass installation operates at a far greater thermal efficiency. It is therefore capable of delivering a far better energy-to-carbon emission ratio for the millions of tonnes of biomass that plants such as Tilbury B would consume.

Back in March 2013, Mark Whettall, managing director of U.K. district heating pipe manufacturer CPV Ltd, called for an end to the way in which the Renewables Obligation is incentivising electricity producers to use biomass fuels in inefficient, conventional power stations.

Whettall: "I of course acknowledge that using biomass is much better than simply burning fossil fuels such as coal, but to do it at such a low level of efficiency — and furthermore provide financial incentives for doing so — really has to be brought into question."

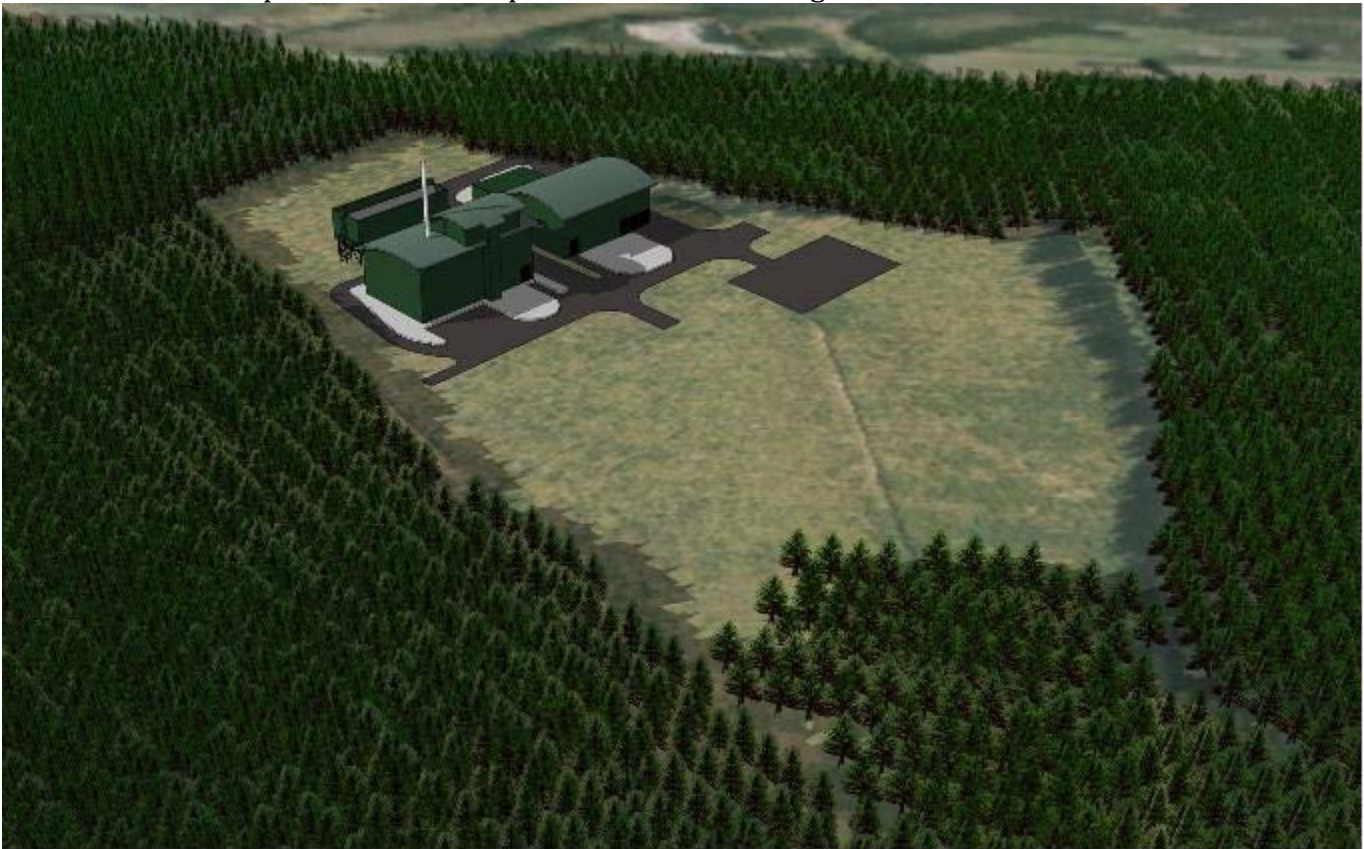
Given that, from an energetic perspective, new build biomass is a far more attractive prospect than conversion, why is North Blyth a bust?

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Clouds Gather

The warning signs have been gathering for some time. Back in October 2012 U.K. utility group Centrica announced that it was withdrawing plans for two biomass power stations, at Roosecote in Barrow-in-Furness and at Glanford Brigg in North Lincolnshire, with a combined capacity of 217 MW.

However, even back then Centrica noted “recent clarification on the regulatory framework relating to dedicated biomass plants indicates a preference for co-firing and coal conversion to biomass.”



Estover Energy plans to develop a £65 million (US\$100 million) biomass-fired CHP plant in the South East of England at Sandwich, in Kent. Generating 11-15 MWe and 8-12 MWth, the plant will use locally sourced low-grade wood as fuel.

The U.K. Renewable Energy Association’s Back Biomass campaign is emphatic though, saying “the introduction of a cap on dedicated biomass under the Renewables Obligation and the lack of support (unless with CHP [see box to right]) under EMR has made this outcome inevitable. This represents a sizeable change in DECC’s ambitions for the sector since 2011.”



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REA Chief Executive, Dr Nina Skorupska, expanded on the issue: "The government used to have a clear policy of supporting the most affordable low carbon technologies, which saw biomass projects attract healthy investment.

"However, recent government actions have eroded investor confidence in the biomass sector. The result is project cancellations totalling hundreds of MWs and millions of pounds of inward investment. This row-back on biomass leaves a huge hole in the government's plans to keep the lights on with low carbon technology."

Dr Skorupska concluded: "The government now must move swiftly to protect both existing and future investment, by giving a strong, clear and positive message that the U.K. is still open for business for biomass."

Unite, Britain's biggest union, also heaped scorn on the U.K. government's energy policies. National officer for energy, Kevin Coyne, blistered: "The government is presiding over an energy shambles. Coal-fired power stations are closing and there are not enough replacements. It is time energy secretary Ed Davey got his act together to prevent Britain from heading into an energy crisis."

The UK's Biomass Giant

According to government figures, biomass is in fact booming in the U.K. Provisional 2013 data suggests that in the U.K. low carbon generation accounted for 32.7 percent of electricity supply in 2013, up from 29.4 percent in 2012, but bioenergy was up by 52 percent and its share had grown to 2.8 percent of the total by the end of the year. The latest provisional monthly energy statistics produced by the Department of Energy and Climate Change and released at the end of February 2014 support this trend, with bioenergy generation up 15.6 percent over the last quarter of 2013.

In this case though, the government acknowledges this is mainly due to the partial conversion to biomass of Drax. Once Europe's largest point source of carbon dioxide emissions, Drax — the 4-GW monster in Selby, Yorkshire, — is now Europe's largest single biomass-fired installation as the company sets about becoming a renewable energy generation company.

In April 2013 it finished converting one of its generating units to biomass and plans to convert a further two units by 2016.

The new £700 million (US\$1 billion) planned conversion project burns wood pellets rather than coal, which Drax calculates will reduce carbon emissions by 80 percent.

Recently publishing its preliminary results for the year ended 31 December 2013, Drax said its transformation to a predominantly renewable power provider was well underway with the first unit delivering 630 MW — at an efficiency only 0.5 percent lower than when using coal.



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With biomass storage and delivery systems fully operational for first unit, in the US, two pellet plants with an aggregate annual capacity of 900,000 tonnes and an associated port facility are under development.

The company says it has further plans to burn increased biomass as an enhanced co-firing unit from May 2014, earning 0.9 ROCs/MWh, in advance of full conversion of the unit, planned for April 2015.

Commenting on the results, Dorothy Thompson, chief executive of Drax, said: “We are well placed to secure CfD Investment Contracts for our second and third unit conversions. We look forward to the conclusion of the government’s contract award process this spring. These contracts will underpin the investment required to secure the sustainable biomass supply chain for our second and third unit conversions.”

However, a joint complaint by Friends of the Earth and Bristol Community Energy Limited has cast a shadow even over this project, having apparently prompted the European Commission (EC) to begin preliminary investigations into U.K. government support in financing the biomass conversion programme.

According to the complaint, In April 2013, the UK Treasury issued a guarantee underpinning Drax Group plc’s £75 million (\$100 million) loan facility to finance the conversion. Friends of the Earth believe that the Drax guarantee is unlawful, on the grounds that the UK has infringed European Union laws on state aid.

Whatever the outcomes of the European Commission investigation into Drax’ finances or the on-going arguments over the energetic — rather than economic — viability of converting existing coal-fired power stations to run on biomass as opposed to supporting dedicated, modern installations, the outcome for the people of Blyth, Northumberland, and more widely the UK’s dwindling reserve capacity margin is, tragically, the same.

Expressing bitter disappointment, RES’ Chief Operating Officer for the U.K., Gordon MacDougall, said: “This is a reminder to government that, without a consistent approach to energy policy, investors and developers will be deterred from delivering the billions of pounds needed to ensure the nation’s energy infrastructure is able to keep the lights on and secure cost effective electricity for British homes and businesses.”

Biomass with CHP

In contrast with dedicated power only biomass plants, biomass-fired combined heat and power installations are continuing to attract investment in the UK, given that they still qualify for significant government support.



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A number of these projects have made advances over the previous few months. For instance, RWE Innogy UK (formerly RWE npower renewables), is in the final stages of commissioning its Markinch Biomass CHP plant in Fife, Scotland. This 65 MW plant will supply up to 120 tonnes of industrial steam per hour to paper manufacturer Tullis Russell. RWE Innogy is investing some £200 million (US\$300 million) in the development, which was built by Metso and Jacobs.

In October 2013 Estover Energy revealed that planning consent has been granted by Dover District Council for its proposal to develop a £65 million (US\$100 million) biomass-fired CHP in the South East of England at Sandwich, in Kent. Generating 11-15 MWe and 8-12 MWth, the plant will use locally sourced low-grade wood as fuel.

Construction is forecast to begin in spring 2014 at the Discovery Park science and technology park.

And in the July, the Helius Energy-developed CoRDe biomass energy plant in Rothes, Speyside, Scotland began operations, using by-products from nearby malt whisky distilleries to produce renewable energy and an animal feed protein supplement, Pot Ale Syrup. Construction began in 2011 on the 8.32 MWe and 66.5 t/h pot ale evaporator plan. The total development and construction costs of the project were £60.5 million.

Furthermore, Kedco plc, is developing the 12 MW Enfield Biomass CHP project in north London.

The Enfield Project has full Planning and Environmental Permission for the conversion of 60,000 tonnes of waste timber per annum into up to 12 MW of electricity and heat.

According to the last project update from the company, MWH Global Inc has been chosen as preferred construction contractor while Statkraft Markets is apparently cued up for the purchase of all the electricity generated by the plant.

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