

Dear Sir/Madam,

Re: Appeal by ECO2 against Mid Suffolk District Council's refusal of planning permission for a Mendlesham Renewable Energy Plant, Norwich Road, Wetheringsett-Cum-Brockford, Appeal Reference APP/W3520/A/14/2211941

Biofuelwatch objected to ECO2's planning application for a biomass power station near Mendlesham in May 2012 and submitted a response to subsequent statements by the developer in April 2013. We maintain our opposition to the development on the grounds specified at those times, but would like to submit further information in relation to this Appeal.

Low efficiency:

As we pointed out previously, this power station proposal was not accompanied by a CHP Feasibility Study and we understand that there is no potential heat customer located nearby. To our knowledge, all successful CHP schemes in the UK have been designed around one or several heat customers and none were originally designed as electricity-only plants and then retrofitted.

ECO2 claim in their planning application that the power station would be 34% efficient. This is far below the 70-80% efficiency commonly reached for biomass combined heat and power plants across Europe. Nonetheless, we believe that the 34% efficiency claim – for which the company provides no evidence - is likely over-optimistic and unrealistic in this case:

+ ECO2's Environmental Statement, dated February 2012, shows that combustion grate, rather than fluidised bed technology will be used.

The European Commission's Reference Document on Best Available Techniques for Large Combustion Plants¹ is based on inputs from "more than 60 experts from Member States, industry and environmental NGOs". It states that biomass grate firing has the lowest electric efficiency of biomass combustion technologies – around 20% (Table 5.3.1). This figure is based on biomass plants with less than 50 MWth fuel input. The Mendlesham plant might achieve slightly higher efficiency by virtue of being larger. However, grate firing is the least efficient biomass combustion technology and the cooling system – air cooled condensers – reduce efficiency compared to other cooling systems (ones which rely on location near a large body of water and could thus not be used at this proposed plant).

+ Appendix 9.3 to the Air Quality Assessment cites the Biomass Environmental Assessment Tool (BEAT2) provided by Defra, the Biomass Energy Centre and the Environment Agency as giving a default value of 25% efficiency for electricity-only biomass power stations, with a total range of 20-30%, but goes on to claim, without backing this up that this power station would reach 34% efficiency, without any heat use. Given that grate firing is less efficient than other combustion technologies used in biomass power stations in the UK, we cannot see how this plant could be more efficient than the range cited in BEAT2.

+ Elsewhere, ECO2's has referred to higher efficiency levels reached, for example, by Drax. Drax is running a 660 MW unit of a subcritical pulverised fuel power station on biomass. This cannot be compared with a 40 MW grate firing biomass plant – it is far more efficient due to the size of the power station unit at Drax and the very different combustion technology used.

¹ http://ec.europa.eu/environment/ipcc/brefs/lcp_bref_0706.pdf

+ ECO2 has indicated that the power station would be closely comparable to the existing Elean Biomass Plant. Given that they cite the same output and fuel input figure for the other three straw-burning power stations being developed (Snetterton, Brigg, and Sleaford), we presume that all of them would use similar technology and reach similar efficiency levels. Therefore, if the Mendlesham plant was to reach 34% efficiency without heat delivery, it follows that any equivalent plant that supplies a significant amount of heat must reach over 35% efficiency. Such a plant would qualify as a “good quality CHP” plant for the purpose of the Renewables Obligation as well as the new Contracts for Difference. The relevant definition requires a limited level of heat use and a minimum of 35% overall efficiency². A biomass plant that meets the definition is eligible for a higher level of Renewables Obligation Certificates, i.e. subsidies (2 rather than 1.5 ROCs per MWh).

If ECO2’s 34% efficiency claims for Mendlesham are correct, then their Sleaford plant should be classed as ‘good quality CHP’ and attract this higher rate of subsidies. This is because it will supply district heating to a local authority swimming pool, a bowling alley, football club, council offices and a school³.

Yet ECO2 has made it clear that the Sleaford plant (despite the heat it will supply and thereby higher efficiency ratings than those the Mendlesham plant can possibly achieve) will only be eligible for 1.5 ROCs per MWh⁴. This strongly suggests that they do not believe that the Sleaford plant can reach 35% efficiency. And if the Sleaford plant cannot reach 35% efficiency despite having supplying heat to a district heating network, then we cannot see how the Mendlesham plant could possibly reach 34% efficiency in the absence of any heat customer.

B) Feedstock requirements underestimated by ECO2

ECO2 have dismissed arguments, including by ourselves, that they have underestimated their predicted feedstock requirement, arguing that their power station will be more efficient than we predict (see discussion above) and that the Elean power station reaches similar efficiency levels and feedstock use in line with that predicted for the Mendlesham power station.

One point on which we agree with ECO2 is that that efficiency and feedstock use figures for the Elean biomass power station (which primarily burns straw) can be used as a guide for predicting the biomass requirement for the proposed Mendlesham plant. However, in relation to the Elean plant, ECO2 state that it is designed to generate 270,000 MWh of electricity from 200,000 tonnes of straw a year⁵. We, however, believe that the plant’s actual feedstock use per MWh must be considered, not the assumptions that had been made at the design stage.

According to data published by the Renewable Energy Federation, based on Ofgem’s figures, the Elean plant produced 229,560 MWh of electricity in 2012/13, running at 65% of its capacity⁶. In response to a submission by Sir David King, ECO2 agreed that REF data was a credible source of information.

² https://www.chpga.com/guidance_notes/GUIDANCE_NOTE_44.pdf

³ <http://www.renewablesandenvironment.com/en/re/energy/547/Farmers-tour-biomass-energy-plant-in-Lincolnshire.htm>

⁴ <https://www.ofgem.gov.uk/ofgem-publications/58131/ro-guidance-generators.pdf>, Table 8

⁵ Letter by Andrew Toft, ECO2 to Mr Matthews, 5th July 2012

⁶ <http://www.ref.org.uk/roc-generators/view.php?rid=R00011RAEN&tab=summary&returnurl=http%3A%2F%2Fwww.ref.org.uk%2Froc-generators%2F>

More recently, Ofgem's Biomass Sustainability Report 2012/13 dataset has shown that during that year, the Elean Power Station burned 212,024 tonnes of biomass, of which 198,795 tonnes were straw.⁷ It should be noted that it is the figure contained in the 'Sustainability Report' spreadsheet which is required to be complete (although it is not independently verified). The lower figure cited in the "Land Use and GHG 2012-13" spreadsheet is incomplete because there has been no requirement on companies burning biomass classed as wastes or byproducts (such as straw) to fully account for their land use and greenhouse gas impacts⁸.

Based on these figures for Elean, the proposed Mendlesham power station would require 291,270 tonnes of biomass a year to operate at 90% capacity – 51,270 tonnes more than claimed by ECO2. 90% capacity is what ECO2 have stated they expect the plant to achieve, whilst allowing for routine maintenance⁹. It would translate into 315,360 MWh of annual electricity generation. The biomass and therefore maximum straw requirement will thus be close to 300,000 tonnes per year. This means that local impacts discussed in the Environmental Statement have been underestimated. Furthermore, the consequences for cumulative straw demand for existing and consented biomass power stations are even more significant.

C) Cumulative straw demand for consented biomass power station

As shown above, based on the Elean figure, the Mendlesham plant will require 291,270 tonnes of biomass a year. Based on the same calculations, the projected biomass demand by the already consented straw-burning power stations would be as follows:

Elean plant:

This plant burned 212,024 but ran well below its capacity, which has been increased to 43.353 MW¹⁰. If it was run at 90% capacity (the figure predicted for the Mendlesham plant by ECO2, which accounts for routine maintenance), then it would generate 341.693 MWh of electricity. For this, it would require 315,591 tonnes of biomass a year – that is 103,597 tonnes more than was burned there in 2012/13. We discuss the implications of the Elean plant running below capacity in section C.

Snetterton and Brigg plants:

Those will be of the same size and presumably the same design as the proposed Mendlesham plant and they also have no confirmed heat customers. Therefore the feedstock requirement should be the same, i.e. 582,540 tonnes a year in total.

Sleaford plant:

The Sleaford plant differs from the others in so far as it will also supply heat for district heating. This means it will be more efficient overall – but it will nonetheless require more tonnes of biomass per MWh of electricity. We can find no data to allow us to estimate what the precise feedstock requirement will be – we can only say that it will be in excess of 291,270 tonnes a year.

Drax:

Drax burned 31,434 tonnes of straw in 2012/13 and we presume that this figure will not greatly vary in future, since Drax primarily relies on wood pellets.

⁷ <https://www.ofgem.gov.uk/publications-and-updates/biomass-sustainability-dataset-2012-13>

⁸ <https://www.ofgem.gov.uk/ofgem-publications/86392/roannualreport2012-13final.pdf>, Chapter 4

⁹ See Appendix 9.3 to the Air Quality Assessment submitted by ECO2, Beat2 Model Assumptions

¹⁰ <http://www.ref.org.uk/roc-generators/view.php?rid=R00011RAEN&tab=summary&returnurl=http%3A%2F%2Fwww.ref.org.uk%2Froc-generators%2F>

Thus the cumulative biomass demand from the four consented straw-burning biomass power stations (including Elean if it was run at 90% capacity) plus Drax will be around 1.221 million tonnes a year. If the biomass requirement for Mendlesham is added to this figure, it will come to 1.512 million tonnes. Of course, less straw would be burned if those power stations used other types of biomass, too.

D) Elean power station and straw availability

The fact that the Elean power plant has never run at anywhere near 90% of its capacity suggests that they have been struggling continuously to source sufficient straw.

The Renewable Energy Federation's page about the Elean plant¹¹ shows that the last time this plant achieved a load factor of over 70% was in 2005/06. The plant achieved the greatest output of electricity in 2003/04 and even though the technical capacity has been increased twice since then. There have been no reports of any technical problems at the plant and therefore we can think of no reason why the plant has been running well below capacity other than problems with accessing enough feedstock. This would contradict ECO2's claims about large-scale straw availability.

While lack of available straw could affect the economic viability of the proposed Mendlesham plant (which would not be a material planning concern), if ECO2 were able to sign up enough cereal farmers to long-term supply contracts, the risks and impacts of straw shortages could be placed entirely or primarily on livestock farmers who are heavily dependent on purchasing straw bales. This, we believe, affects the economic sustainability of the development which is defined as a material planning issue in the current National Planning Policy Framework. Indeed, the operators of the Elean plant have consistently managed to source substantial amounts of straw (even if not the full amounts needed to run the plant at full capacity) – even though regional scarcity of straw has been widely reported over several periods in recent years and has led to significant straw price rises. This supports our concerns that yet another straw-burning power stations would pose a significant risk to the livelihoods of pig farmers in the area.

Yours faithfully,

Almuth Ernsting
Co-Director, Biofuelatch

¹¹ <http://www.ref.org.uk/roc-generators/view.php?rid=R00011RAEN&tab=summary&returnurl=http%3A%2F%2Fwww.ref.org.uk%2Froc-generators%2Fsearch.php%3Fmode%3Dclient%26rid%3D%26GeneratorName%3DElean%26CtryCode%3D%26kwaction%3Dequals%26InstalledkW%3D%26TechGroup%3D%26TechCode%3D%26dateaction%3Dequals%26AccreditationDate%3D%26Location%3D%26CHP%3D%26turbineaction%3Dequals%26NumTurbines%3D%26TurbineModel%3D%26HubHeight%3D%26BladeDiam%3D%26Developer%3D%26Operator%3D%26SiteOwner%3D%26Postcode%3D%26save%3DSearch>