Dear Sir/Madam

RE: Planning application no. 0759/12 for Construction of a Biomass Renewable Energy Plant

16th May 2012 - On behalf of Biofuelwatch, I am writing to object to ECO2's proposal for a 40MW biomass power station near Mendlesham. Biofuelwatch is an environmental and human rights organisation which campaigns to expose the adverse impacts associated with the bioenergy industries. Our grounds for objection can be summarised as follows:

We contend that the biomass sourcing proposal put forward by ECO2 is not credible, firstly because it serious underestimates fuel requirements for a 40 MW power station and, secondly, because it overestimates the local availability of straw. We would therefore agree with the conclusion of the Suffolk Preservation Society that the power station will primarily rely on non-local wood supplies.

While we will list some of our major concerns about wood burning for electricity, related to sustainability, carbon emissions and local impacts below, we note that the EIA is based on the power station burning 240,000 tonnes of biomass most of which will be local straw. If this basic assumption is flawed, then so must be a range of key findings of the EIA, including in relation to 'carbon savings', traffic, air quality. Unless Eco2 can demonstrate the credibility of their sourcing assumptions, we therefore believe that a new EIA should be requested. Finally, we wish to object to the proposal because of the very low efficiency levels which would be reached by this type of biomass power station at the proposed location.

Fuel requirements:

The Environmental Statement states that the power station would burn 240,000 tonnes of biomass, primarily straw but with the possibility of supplementing straw with woodchips in case of a shortfall in straw supplies. We cannot see how a 40MW power station of the design put forward by Eco2 can operate on just 240,000 tonnes of straw a year:

Energy conversion figures can be found on the Biomass Energy Centre's website[1]. Biomass Energy Centre is a research agency owned and managed by the Forestry Commission and supported by and working with Defra. According to their website (see "Facts and Figures"), wheat straw has a net calorific of 13.5 MJ/kg, i.e. 13,500 MJ/tonne and the conversion rate to be used is 1MJ = 0.275 kWh and 1 kWh = 3.6 MJ .

We assume that the power station would operate not 100% of the time but 8,000 hours a year and thus produce 320,000 MWh of electricity annually.

To estimate likely efficiency levels, we have looked at data contained in the IPPC's Reference Document on Large Combustion Plants, published by the European Commission[2]. Although the document refers to power stations 50 MW and larger, we have found no literature which suggests that a smaller power station using the same technology as a 50MW would reach

1 www.biomassenergycentre.org.uk, See: Facts and Figures

2 http://eippcb.jrc.es/reference/BREF/lcp_bref_0706.pdf , especially Table 2, Page 6

higher efficiency levels. The document states that the average efficiency level for a grate-fired biomass power station without heat use is 20%. According to the Environmental Statement, the proposed power station will use grate-firing for combustion. The above document also shows that using air-cooled condensers rather than water cooling will reduce the overall efficiency, however for our calculation we have assumed 20% efficiency, not less. ***Using the above figures, it would appear that 426,665 tonnes of straw a year would be required to run a 40 MW grate-fired power plant at full capacity for 8000 hours a year.*** The difference compared to the 240,000 tonne figure put forward by ECO2 is such that we believe it puts a large range of assumptions and conclusion made in the EIA into question.

Feasibility and impacts of sourcing local straw:

We note and would commend the evidence put forward by the Suffolk Preservation Society, although their objection was written on the understanding that no more than 250,000 tonnes of straw would be burnt. A higher fuel requirement means that the power station is even less likely to be run mainly on straw – whilst a theoretical straw demand of more than 400,000 tonnes a year on farmers in East Anglia would clearly be even more severe than predicted by the Suffolk Preservation Society for 250,000 tonnes.

While we are less familiar with local straw markets than the Suffolk Preservation Society, we are aware that, as they warn, excessive straw removal from soils increases the need for fossil-fuel based fertilisers, which means more greenhouse gas (mainly nitrous oxide) emissions and more nitrate run-off, as well as depleting soil carbon and making soils more vulnerable to drought. As Defra's Code for Good Agricultural Practice states: "Incorporating crop residues that do not contain much nitrogen, such as cereal straw, into the soil in autumn will help to reduce the amount of nitrate leached and to maintain or increase soil organic matter."[3] Suffolk and Norfolk are at a particular risk of drought and we understand that last year's spring drought led to a serious shortage of straw – according to a livestock industry magazine in 2011: "*As of June 16, there was virtually no barley straw left for sale in the East Anglia region, according to reports.*"[4].

Given competition from livestock farmers (who, as the Suffolk Preservation Society has shown, heavily depend on the availability of affordable local straw), as well as from the Elean Power Station, the Sleaford Power Station currently under construction and the proposed Snetterton Biomass Power Station, we cannot see how Eco2 could possibly source the majority of their biomass from straw from East Anglia. Each of the above power stations is the same size as that proposed for Mendlesham, although we understand that the Elan Power Station has been operating well below capacity (less than 23 MW rather than the installed 40 MW according to the Renewable Energy Federation). If they were to operate at full capacity, their straw requirement would go up substantially.
Whilst any substantial straw demand from the proposed biomass power station would have serious negative economic and environmental impacts, we thus cannot see a viable alternative to running the power station primarily on wood.

Impacts of large-scale woodchip burning:

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3 Protecting our Water Soil and Air, A code of good agricultural practice for farmers, growers and land managers, Defra, 2009, http://adlib.everysite.co.uk/resources/000/252/413/water_air_soil_code_2009.pdf

4 www.wattagnet.com/British_pig_producers_facing_straw_shortage.html

As we have pointed out, the EIA is based on straw being the primary fuel, which means that ECO2 has not so far assessed the potential impacts of running the power station primarily on woodchips, especially considering that they appear to have seriously underestimated total fuel requirements, too.

The projected biomass power station capacity in the South-east of England is 750 MWe at Tilbury B (installed but currently closed following a major fire), 79 MW at Peterborough (approved), 25 MW at Ridham (approved). We understand that there is an additional wood demand from the Thetford power station, although that is primarily fuelled with chicken litter.

In terms of supply, the Forestry Commission's e-forestry database5 shows that the maximum available annual wood supply up to 2016 across the whole of South-east England is around 517,000 oven dried tonnes – for all wood uses. According to the E-Forestry website, stemwood of more than 14 cm top diameter is in such high demand from other industries that it is not economically viable to use for bioenergy. If stemwood above that size is excluded then only 104,000 oven dried tonnes a year are available across the whole region – about a quarter of the requirement by the proposed Mendlesham power station if it was run on wood alone.

Overall, industry proposals for biomass electricity in the UK will, if they are all realised, require more than 80 million green tonnes of wood to be burnt annually6. According to Forestry Commission statistics, total annual wood production in the UK is only around 10 million green tonnes. This means that the vast majority of wood used for bioenergy will be imported. If, as seems highly likely, a 40 MW biomass power station at Mendlesham was to be run largely on woodchips then the demand would further increase the UK's overall requirement for imported wood biomass. The low availability of wood in East Anglia, coupled with the large competition for it from other biomass power stations, suggests to us that wood imports (possibly via Folkestowe or Harwich) may well be the most realistic option for Eco2. Here is brief outline of our concerns about imported biomass for electricity:

Carbon emissions

Per unit of energy produced, burning biomass produces one and a half times the amount of CO2 as coal.[i] The production of this CO2 only becomes 'carbon neutral' ***if and when*** new trees are grow to replace the Carbon which has been emitted through combustion. This process, depending on the fuel burned, can take between 20 and up to 200 years, if it happens at all.[ii] The European Environment Agency's Scientific Committee has therefore warned, '[the] mistaken assumption [of carbon neutrality] results in a serious accounting error' and 'legislation that encourages substitution of fossil fuels by bioenergy, irrespective of the biomass source, may even result in increased carbon emissions – thereby accelerating global warming.'[iii]

<u>Low efficiency:</u>

European Union legislation suggests that Member States should promote power stations which try to achieve efficiency levels of at least 70%.[iv]

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5 ww.eforestry.gov.uk/woodfuel/FWDOCGEN.do

6 See figures at http://www.biofuelwatch.org.uk/biomass_map/

Yet, as discussed above, it appears that the proposed power station will only be 20% efficient, which means that 80% of all biomass burnt will simply be wasted as uncaptured heat.

Eco2 state that, if heat customers became available, they could convert the power station to a CHP plant, however they have not identified even potential heat customers and the rural location precludes the possibility of any district heating network. The proposed ECO2 development is an electricity-only power station design with a vague commitment to add a heat connection at a later date, should heat customers become available. Biofuelwatch is unaware of any successful conversion from an electricity-only to a CHP plant anywhere in the UK.

Local impacts:

While we have not looked in detail at the local impacts, we believe that those identified by Eco2"s EIA need to be fully re-evaluated in view of the fact that the projected fuel requirement will be far higher than they claim and that wood, most likely imported wood, appears likely to account for the large majority of the fuel.

Local impacts which would need to be reassessed would include air quality (with modelling based on lower than realistic amounts of straw being burnt), traffic, and also ash disposal, since wood ash even from clean virgin wood can be so high in heavy metals as to be unsafe for agricultural use7. A re-assessment of Air Quality impacts would need to consider both the 425,000 tonnes of straw, and a mix of straw and wood. That is it should be conservative and look at worst case scenario. Burning straw produces more NOx (since straw has a higher nitrogen content) and more dioxins / furans than burning virgin wood8.

Best regards,

Almuth Ernsting
Biofuelwatch

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i Manomet Study
ii Joanneum Study
iii EEA Study
iv RED, Art 13(6)

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7 http://ec.europa.eu/environment/integration/research/newsalert/pdf/103na3.pdf

8 http://ec.europa.eu/environment/dioxin/pdf/report09.pdf and Houshfar E., Løvås T., Skreiberg Ø., "Experimental Investigation on NOx Reduction by Primary Measures in Biomass Combustion: Straw, Peat, Sewage Sludge, Forest Residues and Wood Pellets", Energies, 5 (2), pp 270-290, 2012. [DOI: 10.3390/en5020270]