

Dear Sir/Madam,

Re: Bespoke Installation Permit Application for a gasification plant at Kin George Dock, Port of Hull by Biomass UK No. 1 LLP

I am writing on behalf of Biofuelwatch to object to and comment on Biomass UK No. 1 LLP's application for a Bespoke Installation Permit.

Biofuelwatch is a UK/US non-profit organisation which has been providing research, information and advocacy in relation to the impacts of large-scale industrial bioenergy since 2006 (see biofuelwatch.org.uk). We provide support and information to local campaigners opposed to biomass power stations, including biomass plants using advanced conversion technologies.

We wish to object to this permit application because we believe that the developer has not provided any evidence of compliance with Article 4 of the Waste Framework Directive, i.e. with the Waste Hierarchy Principle. Schedule 9 of the Environmental Permitting (England and Wales) Regulations 9 states:

“4. The regulator must exercise its relevant functions—
(a) for the purposes of implementing Article 4 of the Waste Framework Directive;
and
(b) so as to ensure that the records referred to in Article 14 of the Waste Framework Directive are kept and made available to the regulator on request.”

We also believe that the permit application does not meet the requirements of Article 23 of the Waste Framework Directive:

“4. It shall be a condition of any permit covering incineration or co-incineration with energy recovery that the recovery of energy take place with a high level of energy efficiency.”

Before discussing our grounds for objection in more detail, we would like to raise our concerns that the Energy Balance statement provided by the developer to the Environment Agency has been withheld from public view on the grounds of being 'commercial in confidence'. The proposed plant's energy balance is of vital importance in relation to requirements under the Waste Framework Directive. We understand that documents of this type are routinely published as part of permit applications as well as planning applications. The information related to energy efficiency that has been published is insufficient for us or any member of the public to make fully informed submissions. In fact, some of the statements on energy efficiency that have been published as part of consultation appear to be contradictory.

We are submitting a separate request for access to the information contained in the withheld Energy Balance statement under Environmental Information Regulations 2004 today.

We believe that an approval of the permit application without publication of the Energy Balance statement would be legally highly questionable, because consultees would have been deprived of key information. This, we believe would render the consultation process unfair and incompatible with the principles of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (ratified by the UK). We would therefore ask for the consultation to be extended until the information has been published and until the public has been given a reasonable amount of time to respond.

No evidence of compatibility with the Waste Hierarchy Principle:

We note that permit application documents contain no reference to the waste hierarchy principle, and no evidence that waste wood will not be diverted from uses further up that hierarchy.

We note that the planning authority, Hull City Council, did not consider compatibility with the Waste Hierarchy Principle either when considering and approving the planning application that forms the basis for the permit application (14/00923/FUL). The Waste Hierarchy Principle was not mentioned at all in the planning officer's report to the committee which considered and then approved the application, and we can see no planning documents related to it. Both the planning authority and the permitting authority need to take account of the Waste Hierarchy Principle. In this case there is no previous evidence regarding and consideration of this issue related to the development to draw on.

The developer states that the feedstock will be "Waste Wood Grade B and Grade C materials as defined by BSI PAS 111 Processing Waste Wood". According to that definition¹, Grade B waste wood is "*a feedstock for industrial wood processing operations, such as the manufacture of panel products, including chipboard and medium density fibreboard.*" And Grade C waste wood is "*biomass fuel for use in the generation of electricity and/or heat*". However, typical Grade B materials "*may contain up to 60% Grade A material as above, plus building and demolition materials and domestic furniture made from solid wood.*" Typical Grade C materials contain "*All of the above plus fencing products, flat pack furniture made from board products and DIY materials. High content of panel products such as chipboard, MDF, plywood, OSB and fibreboard.*" Grade A waste wood is "*a feedstock for the manufacture of professional and consumer products such as animal bedding and horticultural mulches. May also be used as fuel for renewable energy generation in non-WID installations, and for the manufacture of pellets and briquettes.*" ***In short, the feedstock which Biomass UK No.1 LLP seek to use includes all types of waste wood (except for those classed as 'hazardous'), much of it in high demand for the production of wood panel products, animal bedding and horticultural uses. All of those uses qualify as 'recycling' and are thus higher up the Waste Hierarchy than energy recovery.***

A Defra review of waste wood in the UK, published in 2012², confirmed that waste wood is an important feedstock for different industries, above all for panelboard production, and that the UK is already a net importer of wood fibre, including waste wood. The review summarises a 2011 report by Tolvik which estimated that if only 25% of the biomass capacity planned at the time was developed, there would be a waste wood shortfall by 2015. Since then, there has been considerable expansion of biomass capacity across the UK. Defra warned that the shortfall could be even greater because of insufficient waste wood recovery. Defra also cited reports by Pöyry and WRAP with similar findings.

The Wood Panel Industry Federation has previously warned that all of their 8,700 jobs are at risk from biomass electricity, which competes for the same feedstocks³.

Since Defra's review was published in 2012, a significant number of new waste-wood burning power stations have been commissioned or approved. Those include:

- A 65 MWe biomass power station in Markinch which, according to the operators primarily burns waste wood, and which procures a significant proportion of supplies from across England;
- The Tilbury Green Power plant in Thurrock, currently under construction, which is to burn up to 400,000 tonnes of virgin and waste wood a year;

- The Blackburn Meadows biomass power station commissioned by E.On near Sheffield in 2014, which burns up to 270,000 tonnes of waste wood a year;
- The Cramlington Biomass Plant and the Discovery Park Biomass Plant, both currently under construction, which are to burn 270,000 tonnes of virgin and waste wood a year each.

As discussed below, there appears to be a distinct possibility that the plant would not even qualify as 'energy recovery' as opposed to 'waste disposal' based on the R1 formula, although with the Energy Balance information having been withheld from public view, we can only speculate on this point. However, even if the plant did qualify as 'energy recovery', Article 4 of the Waste Framework Directive still requires it not to divert waste from recycling activities. ***We believe that the permit application should not be allowed in the absence of convincing evidence that the development will not violate the Waste Hierarchy Principle.***

Energy efficiency:

The applicant claims that the technology which they have chosen is 'highly efficient'. In our experience, biomass gasification followed by electricity generation through a steam turbine and without heat capture and distribution is the least efficient way of generating energy from biomass. For example, a peer-reviewed study about biomass gasification published in 2014 states:

“The challenge of this system [biomass gasification reliant on a steam turbine] is related to the net electrical efficiency, which is extremely low (10–20%). The high capital cost and the limitation of boiler and steam turbines lead [companies] to avoiding this technology for power generation from biomass gasification gas.”⁴

Given the comprehensive failure of waste and biomass gasification technologies across the UK⁵, there is little or no actual evidence about precise efficiency levels of such technologies.

As we have highlighted above, the published documents for this application include insufficient information about the energy balance of this plant. However the information which has been published appears to be contradictory and even the more conservative figures may well overestimate the efficiency of the plant:

The figures in the Sankey diagram suggest a net electric efficiency of just under 24%: 10.2 MWe electricity generation from an input of 42.8 MWth. The figures contained in the 'Supporting Document' suggest a similar net electric efficiency: Based on the 'design values' of a Lower Heating Value of 14.275 GJ/t and a moisture content of 20%, 86,400 tonnes of waste wood a year, and an assumed operating period of 8,000 hours a year⁶, the net electrical efficiency would be 23.82%, i.e. just under 24%.

Elsewhere, the developer claims: “*The overall energy efficiency of the plant, even when in open cycle when taking account of ancillary uses, has been designed around to achieve 27.1% efficiency, which compares well with the 25% efficiency target stipulated for incineration processes*”. They have published no information about the 'ancillary uses' mentioned, however they make it clear that this is not a combined heat and power plant proposal and that no heat distribution is proposed. We believe that the net electric efficiency figure is the most important one.

According to the current BREF document related to the Large Combustion Plant Directive (now part of the Industrial Emissions Directive), a biomass power station using fluidised bed combustion is expected to achieve an electric efficiency of >28-30%⁷. A net electrical

efficiency below 24% is thus well below what a standard biomass combustion plant would be expected to achieve.

However, we would question the developers assumptions about the Lower Heating Value (net calorific value) of their feedstock, and therefore the figures contained in the Sankey Diagram as well as in the Supporting Statement.

The Biomass Energy Centre, which is hosted by the Forestry Commissions 'Forest Research' and describes itself as 'the most authoritative information on biomass energy'⁸ suggests a higher Lower Heating Value (which would translate into greater energy inputs and thus lower efficiency of the plant). It states that the Lower Heating Value/Net Calorific Value of oven dry wood is 19 GJ/t⁹. The developer's assumed 14.275 GJ/t for a moisture content of 20% would translate into 17.844 GJ/t for oven dry wood. ***If we run the efficiency calculation using the Biomass Energy Centre's figure but keeping all other assumptions the same, we get a net electric efficiency of just 22.37%.***

A biomass/waste plant with a net efficiency of around 22% is clearly not 'highly efficient'. We cannot see how it can be deemed to satisfy Article 23 off the Waste Framework Directive.

As mentioned above, we would question whether the plant would even achieve R1 status, i.e. qualify as 'energy recovery', however essential information on this issue is currently being withheld.

Please can you confirm that our objection has been received and will be considered. Thank you.

Best regards,

Almuth Ernsting
Co-director, Biofuelwatch

¹ www.woodrecyclers.org/wp-content/uploads/2015/04/PAS111.pdf, Annex A

² www.gov.uk/government/uploads/system/uploads/attachment_data/file/82571/consult-wood-waste-researchreview-20120731.pdf

³ www.makewoodwork.co.uk/DDT_Show_Entry_1F_news_feed.asp?GalleryName=Latest_News&EntryID=617&ImageSeqNo=1

⁴ Barriers of commercial power generation using biomass gasification gas: A review Mohammad Asadullah, Renewable and Sustainable Energy Reviews 29 (2014)

⁵ See www.ukwin.org.uk/files/pdf/UKWIN_Gasification_Failures_Briefing.pdf and www.biofuelwatch.org.uk/wp-content/uploads/Biomass-gasification-and-pyrolysis-formatted-full-report.pdf

⁶ Although the documents do not refer to 8,000 hours a year, this is the maximum assumed operating period we have seen in any power plant related planning or permitting application.

⁷ http://eippcb.jrc.ec.europa.eu/reference/BREF/lcp_bref_0706.pdf, Table 3

⁸ www.forestry.gov.uk/fr/bec

⁹ www.forestry.gov.uk/fr/bee-h-abs-g5h