Dear Mr Rigby,

Re: Egnedol's planning application for a waste and biomass gasification plant with ancillary business activities at Blackbridge, Ref APP/N6845/A/16/3146073

We are writing on behalf of Biofuelwatch and Pembrokeshire Friends of the Earth to object to Egnedol's planning application at Blackbridge, Milford Haven.

We are objecting to the application on the following grounds, discussed in detail below:

1) We do not believe that the proposed development constitutes sustainable development as defined by the 9th edition of the Planning Policy Wales (2016), having regard to the Well-being of Future Generations (Wales) Act 2014, nor that it is compatible with Policy SP3 of the Pembrokeshire County Council Local Development Plan.

2) We believe that the developer has failed to demonstrate that the development would comply with the waste hierarchy and waste proximity principles. We further believe that a proposal for a waste pyrolysis/gasification unit at this site is not compatible with GN4.1 of the Pembrokeshire County Council Local Development Plan (2013);

3) We believe that the proposal poses health and safety risks due to the nature of the development and the proximity to neighbouring COMAH facilities and that this contravenes GN1 of the Local Development Plan.

1) Non-compliance with sustainable development principles:

We believe that the proposal should not be regarded as meeting the definition of a sustainable development, for several reasons.

Before discussing those planning reasons in detail, we would like to first summarise our key concerns about this proposed development:

Egnedol seeks to use a highly complex technology – biomass gasification with a high level of syngas cleaning followed by combustion in gas engines – to generate electricity and heat. An unspecified proportion of the syngas would also be captured for conversion to biofuels.

Biofuelwatch has been closely following the development of biomass gasification and pyrolysis projects for power generation. We are aware of a significant number of failed projects in the UK (i.e. plants which could either not be successfully commissioned or which ceased operating soon after commissioning), and not one example of a successful scheme of this type. Evidence published by the UK Without Incineration Network suggests that the same is true for waste gasification and pyrolysis in the UK[1]. Egnedol UK's three directors[2] developed a pilot gasification plant which used the same basic technology proposed at Blackbridge, albeit on a much smaller scale. They did so as directors of a company called Hudol Thermal Ltd. The pilot gasifier was built in Rhymney Valley and obtained an Environmental Permit in October 2008. We

have had confirmation from Natural Resources Waste, that this plant has not been operational since 2009[3].

The ancillary activities proposed by Egnedol depend on a continuous and reliable heat supply from the gasification plant. Without waste heat from the plant, the warm water fish and prawns would not survive; without syngas capture from the gasifier, there would be no feedstock for the proposed advanced biofuels, and without exhaust gases to be captured, the nutrient supply for the proposed algal farms could not be maintained. Yet the experience of other developers and indeed that made by the Egnedol UK directors in Rhymney Valley shows that continuous operation of the gasifier will be virtually impossible to achieve.

Some of the ancillary activities also depend on unproven technologies: Algal biofuel production has been at the Research and Development stages since the 1970s, despite significant public funding, particularly in the US. No company has ever succeeded in producing commercial quantities of algal biofuels and basic technical hurdles have not so far been overcome by anybody. According to the International Energy Agency: "*Realizing the strategic potential of algal feedstocks will require breakthroughs, not only in algal mass culture and downstream processing technologies, but also in the fundamental biology related to algal physiology and the regulation of algal biochemical pathways*"[4]. Similarly, the technology which Egnedol wants to use for turning some of the gas produced by their gasifier into biofuels has never been applied successfully at a commercial scale. Several companies have built plants attempting to do so, but all such attempts have failed[5].

While there are no examples of successful operations of biomass or waste gasification power plants in the UK, there are examples of attempts to commission and operate such plants having resulted in significant health and safety problems. We discuss those under (3) below.

We believe that track-record of the technologies proposed must be taken into account when considering whether this development can in fact contribute to generating renewable energy, and whether it can benefit the regional economy, including through job creation.

The current Planning Policy for Wales states:

> "The Well-being of Future Generations (Wales) Act establishes a 'sustainable development principle'… In order to achieve this principle, we expect all those involved in the planning system to adhere to: …
>
> - using scientific knowledge to aid decision-making, and trying to work out in advance what knowledge will be needed so that appropriate research can be undertaken…;
> - taking account of the full range of costs and benefits over the lifetime of a development, including those which cannot be easily valued in money terms when making plans and decisions and taking account of timing, risks and uncertainties…" (4.3.1); AND
>
> "Decisions should….promote quality, lasting, environmentally-sound and flexible employment opportunities" (4.4.3).

We therefore believe that science-based evidence about the prospects of a development of this type to succeed must be sought and fully considered. The developer's claims about economic benefits, job creation and the generation of renewable energy should not be accepted in the absence of credible evidence that those can be delivered with the technologies proposed.

The Blackbridge site has been classed as a "*strategic employment site*" in the Pembrokeshire Local Development Plan, in order "*to support the future development of port and energy related activities in proximity to the Milford Haven Waterway*" (Policy SP3). ***We believe that approval of this planning proposal carries a high risk of this site being instead used for experimental activities with no realistic prospect of economic success and of long-term job creation, nor, for that matter, energy generation. Such an outcome would contradict the intended use of this site under the Local Development Plan, and undermine the long-term sustainable economic development of this area.***

If the proposed scheme was to be operated successfully, this would give rise to two other sustainability concerns:

Efficiency:

According to the Planning Policy for Wales, "*good design should promote the efficient use of resources, including land. It should seek to maximise energy efficiency and the efficient use of other resources*" (4.11.5). This requirement is also reflected in Technical Advisory Note 12 (Design).

The information contained in Egnedol's planning documents does not assure us that the development will use good design in terms of maximising energy efficiency and efficient use of resources

The claims about energy efficiency made in Egnedol's EIA are very confused. For example, they claim: "*Each tonne of biomass contains approximately 3.3 MW of energy*". The energy contained in fuel is the calorific value or heating value, and it cannot be measured in Megawatt. And the figures cited by Egnedol do not correlate with any published figures we have seen which are expressed in the correct units (e.g. MWh/t or GJ/kg). It is also claimed by the developer that "*during gasification, mass is conserved and the Gross Energy in the gas produced will be the same as the solid from which it was derived*". Clearly, energy must be lost when the syngas is cooled down before it can be cleaned. And some energy will be contained in the "elemental carbon" which Egnedol state elsewhere they will recover for use for advanced biofuel production.

Our own estimate is that the electrical efficiency of the plant would only be around 20%, which is much lower than what conventional biomass power plants of this size would generally achieve. We cannot see how this can be considered to meet the 'good design' and efficiency principles which must be met by sustainable developments:

Our efficiency calculation:

Input:

240,000 tonnes of woodchips with 20% moisture[6]: 4.1 MWh/t[7] PLUS
240,000 tonnes of Class 3 waste with 20% moisture: net calorific value at least 15MJ/kg or 4.17 MWh/t[8]
Average between both values: : 4.14 MWh/t or 14,904 MJ/t

Energy contained in 480,000 tonnes (50% virgin wood, 50% waste):
1,987,200 MWh or 7,153,920 GJ

If the plant was to operate 8000 hours a year, it would generate 399,200 MWh. That is 20.09% of the energy input.

Heat use would increase the overall conversion efficiency of the plant, but even so, the electrical efficiency would appear to be extremely low.

Furthermore, Egnedol give no indication how they can possibly divert some of the syngas for biofuel production and still operate a 49.9MWe plant using this technology and gasifying 480,000 tonnes of feedstock a year.

Given that efficiency is a material planning matter we believe that clarifications and further information must be sought from the applicant.

2) Non-compliance with local and national waste policy principles:

50% of the total 480,000 tonnes of feedstock which Egnedol plans to gasify annually is to consist of waste derived fuel. Local, national and EU policy on waste management make it clear that the waste hierarchy and waste proximity principles must be complied with in relation to the 240,000 tonnes of waste derived fuel a year which Egnedol wants to use to generate energy.

The waste hierarchy principle states that priority must be given to reuse and, failing that, recycling of waste, above the use for energy recovery. Waste disposal is at the bottom of the hierarchy, below energy recovery, and waste prevention at the top, above reuse. Waste should be used as high up the waste hierarchy as possible. This principle is set out in

- the EU Waste Framework Directive (Article 4);
- Towards Zero Waste – The Overarching Waste Strategy Document for Wales, published 2010;
- Planning Policy Wales, 9th edition, published 2016 (Paragraph 12.5.1);
- Technical Advice Note 21: Waste, published 2014;
- Pembrokeshire County Council Local Development Plan to 2021, adopted 2013 (GN.42).

Egnedol's planning application and their Environmental Impact Assessment fail to mention or any way address the waste hierarchy principle. They give no information as to whether all of the waste would be diverted from landfill (which would comply with the waste hierarchy) or whether all or part of it would be diverted from recycling or reuse (which would not comply with it).

The waste proximity principle, requires waste "*to be recovered in one of the nearest appropriate installations, by means of the most appropriate methods*

and technologies, in order to ensure a high level of protection for the environment and public health"[9]. The waste proximity principle is set out in:

- the EU Waste Framework Directive (Article 16);
- Towards Zero Waste – The Overarching Waste Strategy Document for Wales, published 2010;
- Planning Policy Wales, 9th edition, published 2016 (Paragraph 4.3.1);
- Technical Advice Note 21: Waste, published 2014 (Paragraph 2.9);
- Pembrokeshire County Council Local Development Plan to 2021- Waste Planning Background Paper (Paragraph 7).

Egnedol's planning documents and EIA mention the proximity principle just once, but only in relation to virgin biomass, not to waste derived fuel. They have not even attempted to demonstrate a national, regional or local need for an energy for waste facility at the site.

Pembrokeshire County Council's Local Development Plan states:

> "The Regional Waste Plan provides maps showing areas of search for new sites for inbuilding and open-air waste facilities, should the identified sites fail to provide sufficient land to meet requirements. However, the combination of existing waste facilities (as identified in the Waste Planning Background Paper) and the sites listed in this policy is expected to be sufficient to meet needs within the Plan period. The combination of existing waste facilities (as identified in the Waste Planning Background Paper) and the sites listed in this policy is expected to be sufficient to meet needs within the Plan period."

The only requirement for a new energy from waste facility identified in the Waste Planning Background Paper (which accompanies this Local Development Plan) was for an anaerobic digester for food waste. The Background Paper does state: "*There is potential to establish an 'Energy from Waste' facility in the County and this would probably need to be located close to an end-user for the energy created – in other words, a major existing industrial facility*". Egnedol's proposed gasifier, however, would not supply any major existing industrial facility.

We therefore cannot see how Egnedol's proposal for generating energy from waste can be considered compatible with local and regional waste planning policy.

In this context, we would like to cite from Welsh Government's decision to reject a planning appeal by Eco Pellets at Peboc Estate, Llangefni in July 2014. In that decision, the Minister agreed with the Inspector's view that "*the sourcing of such large quantities of materials in this region would also place great stress on the markets, displacing existing customers and conflicting with the proximity principle and the waste hierarchy, which are important principles underlying sustainable waste management*". Nothing we have read in Egnedol's planning application assures us that the same would not be the true in this case.

3) Health and safety concerns:

The Pembrokeshire Local Development Plan (GN1) requires developments to "*not cause or result in unacceptable harm to health and safety*" (GN1). In relation to waste treatment it states that "*it must be demonstrated that no significant adverse impacts will be caused to the health and safety of the public*" (GN41).

Attempts to operate gasification power plants are associated with serious health and safety risks. European Commission guidelines for Biomass Gasification warn:

> "During operation of a biomass gasification plant there is an increased hazard potential due to the fact that a potentially explosive, toxic and combustible gas mixture is produced and consumed. The producer gas and residues (ash, liquids, exhaust gases) may cause the following major hazards/risks:
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> + an explosion and/or fire;
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> + health damage to humans (poisoning, danger of suffocation, noise, hot surfaces, fire and explosion) ; and
>
> + pollution of the environment and plant vicinity."[10]

The site to which this planning application relates lies within the boundaries of the COMAH facilities of Dragon LNG and SEM Logistics. Those are designated as top tier COMAH facilities. We are therefore deeply concerned about the health and safety risks of permitting a waste and biomass gasification plant at Blackbridge.

Yours sincerely,

Almuth Ernsting
Biofuelwatch

Eleanor Clegg
Pembrokeshire Friends of the Earth

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[1] See an in-depth report on biomass gasification and pyrolysis by Biofuelwatch, published in 2015: http://www.biofuelwatch.org.uk/wp-content/uploads/Biomass-gasification-and-pyrolysis-formatted-full-report.pdf and http://www.letsrecycle.com/news/latest-news/is-large-scale-gasification-viable/

[2] According to Companies House records (beta.companieshouse.gov.uk/ , accessed 17th January 2017) , the directors of Hudol Thermal Ltd in 2007-2009 were Robert Marshall Prigmore and Steven Whitehouse, and the secretary was Alwyn Bowen. Those three are currently Egnedol UK Ltd.'s directors. Robert Marshall Prigmore is also a director of Egnedol Wales Ltd, and both he and Steven Whitehouse are directors of Egnedol Pembroke Eco-Power Ltd.

[3] See www.biofuelwatch.org.uk/2017/hudol-thermal for evidence obtained from Natural Resources Wales

[4] http://task39.org/files/2013/05/IEA-Task-39-Current-Status-and-Potential-of-Algal-biofuels0.pdf

[5] The technology in question is called Fischer-Tropsch synthesis. See: https://www.independentsciencenews.org/environment/biofuel-or-biofraud-the-vast-taxpayer-cost-of-failed-cellulosic-and-algal-biofuels/ .

[6] 20% moisture figure contained in Egnedol's EIA

[7] See www.forestry.gov.uk/fr/beeh-absg5h

[8] See www.wrap.org.uk/sites/files/wrap/WDF_Classification_6P%20pdf.pdf

[9] From Article 16 of the EU Waste Framework Directive

[10] https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/gasification_guide_final_guideline_for_safe_and_eco_friendly_biomass.pdf