

**Friends of the Earth Tayside**  
44 West Henderson's Wynd  
Dundee  
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24 September 2010

The Scottish Government,  
Energy Consents and Deployment Unit,  
4<sup>th</sup> Floor,  
5 Atlantic Quay,  
150 Broomielaw,  
Glasgow,  
G2 8LU

Dear Sir / Madam,

**Proposed Dundee Renewable Energy Plant  
Application by Forth Energy under Section 36 of the Electricity Act 1989**

On behalf of Friends of the Earth Tayside and Dundee University Renewable Energy Society we write to object to Forth Energy's application for consent to construct a biomass ("renewable") energy plant at the port of Dundee.

We acknowledge the need for immediate reduction in greenhouse gas emissions and therefore the rapid transition towards 100% renewable energy within the next few decades. Forth Energy's plans to supply 14% of the Scottish electricity demand from what they claim are "renewable" sources sound very tempting, bringing us closer to our targets - but at what cost?

**Sustainability of Fuel Supply**

Forth Energy are planning to source up to 90% of the required biomass fuel from overseas. They claim that they will "ensure that all forest-derived fuels used at the Dundee Renewable Energy Plant are certified by internationally accepted sustainability certification systems such as the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC)."

However, these standards do not guarantee the protection of virgin forests. Numerous reports demonstrate that FSC certification, which by most NGOs is viewed as the most credible one, certifies monoculture tree plantations instead of protecting "indigenous, traditional and peasant communities' rights and livelihoods; forests, grasslands and wetlands; water, soils and biodiversity". For further information visit [www.fsc-watch.org](http://www.fsc-watch.org)

Forth Energy state that "10% of fuels will be sourced indigenously, with the remainder being imported from Scandinavia, Eastern Europe and North America." However other statements suggest that "For the Dundee Renewable Energy Plant, it is likely that the main energy crops will include eucalyptus and miscanthus." whilst according to their website, fuel will be

sourced from the “Americas”. The company also indicates that it will include a proportion of locally sourced waste biomass in the fuel mix. These inconsistent statements suggest that Forth Energy is uncertain about the countries of origin of the biomass, and sourcing is likely to be driven by market price and availability, rather than careful assessment of the sustainability of different sources.

This tends to be confirmed by Forth Energy’s statement that “The fuel procurement strategy will not be firmed up until the completion of the consenting process” and that they “have commissioned independent research into potential fuel sources, from the Scottish Institute for Sustainable Technology (SISTech), however, this will be for information, and will not be submitted to inform the consenting process.”

Through the lifetime of the plant, Forth Energy claim that they will be “aiming to increase indigenous wood supplies to 30% of the fuel requirement for the Dundee Renewable Energy Plant... to support the local supply chain” however, if transported further than 30 miles, the fuel source is no longer economically and ecologically viable. We do not believe it is feasible for 300 000 tonnes of biomass to be sourced from within a radius of 30 miles around Dundee every year.

Without binding conditions companies can change their “sourcing policies” at any time. A prime example for this is MGT Power, who were given planning permission for a biomass plant at Tees Port. The company stated that it would source most of its biomass fuel from North America but recently signed a Memorandum of Understanding with Suzano Papel e Celulose to supply the bulk of the fuel (eucalyptus, which Forth Energy are also intending on burning) from Brazilian plantations.

“Plants grown specifically for use in biofuel production typically include densely planted, high yielding crop species such as short rotation forestry (e.g. eucalyptus), short rotation coppice (e.g. willow) and grasses (e.g. miscanthus)”. Eucalyptus is known to be an invasive species which dramatically lowers the water table and has a detrimental impact on biodiversity when grown on a commercial scale. Growing high yielding SRC (Short Rotation Coppice) requires proactive fertilised, chemical treatments to be used which are not carbon neutral.

A report commissioned by Forestry Commission Scotland for the Regional Biomass Advice Network (RBAN) in April 2010 suggest that "by 2020 the UK will have a demand for wood of 42 million cubic metres, but a supply of 20 million cubic metres. The forecast deficit is therefore 22 million cubic metres or 55% of the total forecast demand. This is a significantly worse situation than for the EU as a whole and suggests the UK will require more than twice as much wood as it can produce to meet its renewable energy targets".

Another study carried out by Poyry/McKinsey looking at the rapidly growing increase in demand for biofuels across the globe suggests that by 2020 there will be a shortfall of at least 200 million cubic metres of wood fibre in Europe – to put this into perspective: the annual UK wood production is around 8.4 million tonnes, while Forth Energy is planning on burning around 5.3 million tonnes in the four power stations proposed. If all proposed biomass power station plans in the UK were to be realised around 35 million tonnes of biomass would be needed annually.

We do not believe that it is possible to source these vast quantities of biomass in a sustainable manner.

Perhaps the most fundamental question is, whether Scotland should increase its dependence on energy imports which can severely compromise social and environmental justice especially in the global South. Diversion of more land to biofuels in an increasingly crowded planet will inevitably reduce food crop production and drive up food prices which will impact hardest on the poor, notwithstanding the assurances given by Forth Ports. It will inevitably result in further loss of biodiversity and increased indirect pressure on areas of primary forest. Scotland has an abundance of natural resources (wind, marine, geothermal and solar) which can be harnessed locally and sustainably in order to cater for our energy needs. We could also make use of food waste through anaerobic digestion in small-scale local energy plants. Another option would be a much smaller CHP plant using only indigenous sources of fuel. We do not need to take this big step towards the use of primary biomass from overseas, which is poorly thought-through and likely to have such negative consequences.

### **CHP Feasibility, Efficiency and Aquatic Ecology**

On numerous occasions CHP feasibility studies have been submitted along with consent applications for incineration plants in the UK, simply to make the application more attractive. It is questionable whether Forth Energy's intentions to actually supply heat to the local area are sincere. Furthermore the projected output of 30 MWth heat (compared with an output of 112 MWe - including plant operation demand) which equate to around 21% of the total output are shockingly low.

Typically a biomass plant produces 1.5-2x more useful heat than electrical energy. To capture only 15-20% of this is highly inefficient (and runs counter to Government policy on biomass which is to prefer local heat-only or CHP applications). The majority of the heat will not be supplied to households in need (with thousands of people living in fuel poverty in Dundee alone), but instead be discharged into the Firth of Tay (at temperatures up to 10°C warmer than the surrounding water) and Eden Estuary, which is a Special Area of Conservation. The effects on the aquatic ecology could be dramatic. Fish and other life forms close to the source of discharge can suffer and die from sudden exposure to warmer water ('thermal shock'). Furthermore the oxygen levels in the water are reduced which can encourage the growth of algae further reducing oxygen levels. Thermal pollution can also affect the breeding cycle of fish.

The illustration given of heating Ninewells Hospitals 6 times over sounds tempting but Forth Ports' Energy's prospectus ignores the facts that the overall efficiency of the plant is low, there are no consumers for this heat in the immediate vicinity of the proposed site of the biomass power plant and no district heating infrastructure is in place. Lack of attention to these considerations suggests that there is no serious commitment to utilise this thermal output.

### **Climate Change**

Forth Energy's claim that "the renewable energy plants will save 89% to 93% of the carbon emissions associated with a traditional coal fired power station" not only seems highly optimistic but also unfounded considering the uncertainty over the sources of the biomass fuel.

A recent study by the Manomet Center for Conservation Sciences, commissioned by the Massachusetts Department of Energy Resources concludes that

- If biomass is used in electricity-only power stations, the overall carbon emissions/climate impacts will still be worse than those of generating the same electricity from coal after a period of 40 years – the period is 90 years if biomass is compared to gas.
- The carbon impact of burning biomass for heat generation or CHP may be better than coal, however even for CHP, when biomass is compared to natural gas, the climate impacts are still significantly worse after 40 years.

For a detailed review of the Manomet study, see:

[www.catf.us/resources/whitepapers/files/201007-Review\\_of\\_the\\_Manomet\\_Biomass\\_Sustainability\\_and\\_Carbon\\_Policy\\_Study.pdf](http://www.catf.us/resources/whitepapers/files/201007-Review_of_the_Manomet_Biomass_Sustainability_and_Carbon_Policy_Study.pdf) .

*The Joanneum Research study*, commissioned by BirdLife International, the European Environment Bureau and Transport & Environment investigating the carbon debt from wood-bioenergy found that:

- When trees from old-growth forests are felled for bioenergy, there will be no 'climate benefits' compared to fossil fuels for a period of 200-300 years
- The removal of logging residues from forest soils will worsen the carbon balance of bioenergy by 10-40%;
- Where bioenergy results, whether directly or indirectly, in land conversion for tree plantations, the full greenhouse gas impact must be taken into account and if forests are converted to plantations, burning bioenergy will produce more GHGs than the combustion of fossil fuels for at least 150 years.

For a detailed review of the Joanneum Research study, see:

[www.birdlife.org/eu/pdfs/Bioenergy\\_Joanneum\\_Research.pdf](http://www.birdlife.org/eu/pdfs/Bioenergy_Joanneum_Research.pdf)

## **Local Air Pollution**

Forth Energy claim: “The renewable energy plants will have no significant adverse impacts on human health”, which is contradicted by what is known about emissions from biomass power stations and by information contained and implied in their Air Quality Assessment. The company has not provided a Health Impact Assessment, but solely an assessment of likely breaches of legal air quality limits.

Health concerns resulting from the combustion of biomass have been raised both in Scotland and abroad. “The mortality health impacts of these [UK bioenergy scale-up] scenarios were estimated to be between 340,000 and 1,750,000 measured as the number of life years lost in 2020 from the impact on air quality of increased biomass combustion”, Jim Fitzpatrick as Secretary of State for Energy and Climate Change, 2009.

Burning biomass, in this case from both treated and untreated wood, releases a range of toxic emissions such as very small particulates (PM 2.5) and arsenic, for which no 'safe levels' exist. Health risks range from cardiac and respiratory disease caused by nitrogen oxides (Nox, NO<sub>2</sub>) and small particulates (PM 2.5 and PM<sub>10</sub>) to cancer and birth defects caused by dioxins, heavy metals or chromium. In the US, 90 physicians and organisations, the American Lung Association in Massachusetts, the Massachusetts Medical Society and the Florida Medical Association have all warned strongly against biomass power stations due to the health risks they pose.

The Air Quality assessment shows that, acid deposition is already beyond legal limits and the contribution from the proposed power station will be above 1% of the permitted levels, which is classed as 'significant'. The Assessment fails to take nutrient nitrogen deposition into account which is in the critical range at the same site.

Dundee City is an Air Quality Management Area, i.e. an area considered to be already in breach of or at high risk of breaching legal air quality limits, in this case over NO<sub>2</sub> levels, with further concerns over particulate pollution. This means that Dundee City Council is obliged to implement policies to reduce those air pollutants. According to Forth Energy's Air Quality Assessment, the contribution which the power station will make towards the hourly legal limit for NO<sub>2</sub> is 20.2%, the contribution towards the annual average limit is 5.5%, both levels which would be seen as 'significant'.

There is significant uncertainty about how much chemically treated wood will be burned and what chemicals this will contain. The Air Quality Assessment should consider the 'worst case' scenario but there is no information to suggest that this has been done with regards to toxins from (heavily) treated wood (such as Eucalyptus from plantations).

Sea haar conditions do not appear to have been properly assessed, even though they have the potential to reduce air circulation and increase local pollution levels in a 'worst case scenario'. Also, there is a high potential for wood dust and dust from fly ash around biomass power stations, and the health impacts of those becoming airborne has been ignored in the modelling.

It appears that emissions from biomass burning for electricity generation only have been considered in the air quality model. Oil burning during engine startup and use of a backup boiler required for any heat distribution have not been taken into account which means that the model does not reflect the 'worst-case scenario'.

According to Table 9.5, the long-term average concentration of PM<sub>10</sub> is 16.1 microgrammes/m<sup>3</sup> in Broughty Ferry Road – just 1.9 microgrammes/m<sup>3</sup> below the legal limit. Table 9.8 states that the power station will contribute an additional 1.9 microgrammes/m<sup>3</sup>, but compares it to a 'maximum' background level of only 14.2, not 16.1. Given that residential houses next to Broughty Ferry Road are as close as 300 metres north of the site, and only marginally further to the north-east (in the prevailing wind direction) and that the chimney will be 90 metres high, the suggestion that additional particulate pollution there will be minimal seems questionable.

The Assessment appears to be based on the assumption that the fabric bag filters will effectively minimise particulate pollution. There are, however, concerns over the method they propose. If a filter bag tears, this can result in very high emissions and those can have long-lasting health effects even if people have only been exposed for a short period. Such an accident happened at Dundee Energy Recycling Ltd in 2001.

Even with the 'best available technology', pollution from a 100 MW power station will still be substantial. However, there are reasons to think that Forth Energy are not even proposing to use such technology:

- For NO<sub>x</sub> reduction in power stations of this size, Selective Catalytic Reduction is widely regarded as more efficient than Selective Non-Catalytic Reduction which is cheaper and which Forth Energy proposes to use

- For particulate emissions, the planning application merely states that filter bags will be used – no further specification is given. The main problem with filter bags are that they filter out the larger but not the smaller particulates, yet smaller particulates pose the greatest risk to human health. Filtering out PM 2.5 would require such tightly 'woven' filters that the pressure in the stack becomes so high and interferes with electricity generation.

## **Conclusion**

In conclusion, whilst we are strongly supportive of investment in renewable energy generation that is suited to the Scottish circumstances and resources, we do not believe that a project dependent on long-term supply of very large volumes of wood biomass on the global market is sustainable in environmental or social terms.

We would instead favour a much smaller, heat-led CHP biomass proposal (i.e. something that is highly efficient and around 10-20% of the scale of this proposal, and which would not rely on imported biomass), or a bio-digester using local food waste.

We do not think the developer's claims on emissions reduction are credible for the timescale they claim (90% reduction over a 20 year cycle of biomass production) - current research into woody biomass suggests getting close to carbon neutrality only on timescales of 50-100years plus.

And we have serious concerns about the potential impact of pollution on air quality and the aquatic environment.

For all these reasons, we oppose the application by Forth Ports.

Regards

Andrew Llanwarne

Doug McLaren

Kimberley Ellis