Roosecote Biomass Project
at Barrow in Furness, Cumbria
Biofuelwatch Community Briefing

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This is a Biofuelwatch briefing intended to help you understand the implications of a proposed biomass power station. Please circulate it far and wide, and get in touch with us as biofuelwatch@ymail.com *if you have any queries. Biofuelwatch is an organization that works to raise awareness about the adverse impacts of industrial bioenergy on the environment and human rights.*

The Roosecote Biomass Power Station has been advertised as an environmentally-friendly power station which will help contribute to carbon dioxide savings. This is far from the case. This plant will rely on an unsustainable amount of imported wood, thus contributing directly or indirectly to forest loss globally. Biomass power stations produce about 50% more up front carbon dioxide emissions than coal power stations and new trees will take decades and in some cases centuries to re-absorb that carbon. Biomass electricity therefore accelerates global warming at a time when scientists warn that emissions must be reduced quickly, at least for several decades. From a **local perspective**, this power station poses a significant risk to residents' health. Biomass power stations emit over 70 different pollutants, some of which cause or worsen respiratory and heart disease and others which are linked to cancer and birth defects. Biomass power stations cause significantly more local air pollution than gas power stations – i.e. the proposed plant will be more polluting than the power station which it is to replace.

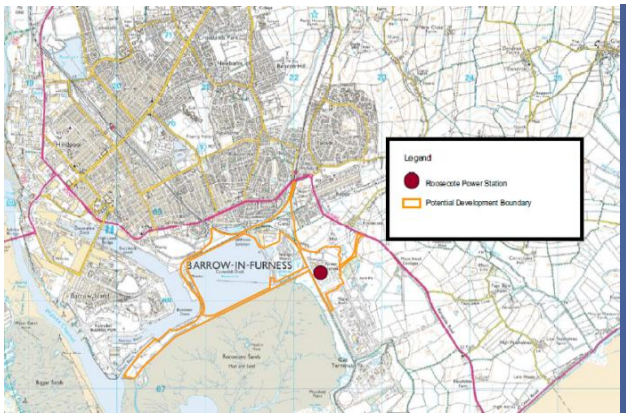
Here are some facts and figures that you should know about the proposed power station:

Developer: Centrica: http://www.centrica.com/

Scoping Report (rough plan of the project): available at http://www.centrica.com/files/pdf/centrica_energy/Roosecote_Environmental_Impact_Assessment_Scoping_Report.pdf

Plant Capacity: up to 80MW electricity. This is bigger than any existing biomass power station in the UK.

Location and height: At the site of the existing operational Roosecote Gas Power Station, 600m to the South East of Barrow in Furness. The tallest new constructions will be the boiler house which will be around 70m tall, and the chimney stack, which is expected to be around 90m high.



Map courtesy of Centrica, Roosecote Biomass Scoping Report

Map extracted from GoogleEarth: Power station indicated by yellow placemark

Related development: loading and handling facilities at Barrow Docks to accept importation of fuel by ship & new transportation system (rail and/or conveyor) to get fuel from Docks to the site.

Who are the Nearby Communities, and how close are they to the site?

- Roose gate: **400m** north of the site
- New House Farm: **500m** northeast of the site.
- Allotment Gardens: **600m** north of the site
- Barrow-in-Furness: **2.3 km** from the site
- Note that the prevailing Southwesterly winds will carry the pollution from the stack to New House Farm. Winds from the South/Southeast will carry to Roose Gate and Barrow-in-Furness

How efficient will the power station be? Will it supply heat as well as electricity?

Electricity from biomass is produced by burning the biomass, and then converting the heat generated from this process into electricity. This is a very inefficient process: most of the energy is lost up the smoke stack as heat. The proposed power station is likely to be just **28-30% efficient**, presuming no heat is captured and supplied. This means that over two thirds of the power produced will go to waste,[1] making air emissions, deforestation, and impacts on air quality seem all the more futile. EU law recommends that biomass power stations should only be promoted if they achieve efficiency rates of 70%,[2] and the UK's Committee on Climate Change would also prefer to see biomass deployed in such a way as to make best use of heat.[3]

The only way of making biomass power stations more efficient is to capture the ***heat*** they produce as well as electricity, and use that to heat homes and other buildings and/or processes. Centrica have made no firm commitment to supply heat from this development.[4] They merely suggest that opportunities might be investigated. They even suggest that they will be doing the environment a service by discharging warm water into Cavendish Dock: 'the continued generation of electricity at the site will maintain the elevated temperature regime in Cavendish Dock, which supports the important ecology of this site.' In fact, a peer-reviewed study about marine life at Cavendish Dock shows that the existing gas power station has had no impact at all on the fish species studied.[5]

What will be burned?

A mix of virgin wood chip and pellets, with potentially up to 50% from recycled/wood chips. According to the Scoping Report, the sourcing of the fuel has yet to be determined.[6] Yet according to a report by the Waste & Resources Action Programme (WRAP), biomass demand for waste wood will outstrip total waste wood arisings in the UK by 2015.[7] In the northwest of England, the Roosecote power stations would already compete for waste wood with Peel Energy's approved 20 MW power station at Ince Marshes, with UPM's 20 MWe existing biomass CHP plant Shotton, and it would also compete with E.On's 30 Mwe biomass power station at Blackburn Meadow, which is under construction, all of which are supposed to run largely on waste wood.

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[1] DECC Consultation, 'Heat and Energy Saving Strategy' Chapter 7: Combined Heat and Power and Surplus Heat paragraph 7.2, available at *http://hes.decc.gov.uk/consultation/download/index-32178.pdf*

[2] Article 13(6) Renewable Energy Directive, available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF

[3] Committee on Climate Change, 'Bioenergy Review' (December 2011), available at http://downloads.theccc.org.uk.s3.amazonaws.com/Bioenergy/1463%20CCC_Bioenergy%20review_bookmarked_1.pdf , pp 11,71

[4] Centrica, 'Roosecote Biomass Power Station: Environmental Impact Assessment Scoping Report,' www.centrica.com/files/pdf/centrica_energy/Roosecote_Environmental_Impact_Assessment_Scoping_Report.pdf, p 9

[5] S Markoxski, 'Faunistic and Ecological Observations in Cavendish Dock', Journal of Animal Ecology Vol. 31, No. 1 (Feb., 1962), pp. 43-51, available at http://www.jstor.org/pss/2331

[6] Centrica, 'Roosecote Biomass Power Station: Environmental Impact Assessment Scoping Report', appendix 5.1

[7] WRAP, 'Realising the Value of Recovered Wood' (Summer 2011), available at http://www.wrap.org.uk/downloads/Wood_MSR_Final_Aug_2011.de3f1f04.11101.pdf

How much fuel will be burned?

Centrica claim that **430,000 – 600,000 tonnes** of wood per year will be burned every year. However, the lower figure is clearly for **oven dry tonnes of wood**[8] and it **translates into more than 1 million tonnes of conifer wood a year being cut/removed from forests and plantations** (wood taken directly from forests and plantations is measured in 'green tonnes' and contains 50-60% moisture).This power station is part of a bigger biomass boom in the United Kingdom, with over 40 large biomass power stations proposed, which is making wood an increasingly scarce resource domestically and internationally The proposed power stations across the UK will require over 60 million green tonnes of wood per year when total domestic wood production is less than 10 million green tonnes per year. Although the developer does not state where it proposes to source its wood from, experience from other proposals, as well as increasing competition for scarce wood in the UK, would suggest that the majority (at least 80%) will have to be imported from overseas.

The biomass boom in the UK and Europe is having the effect that demand, both domestically, and globally, is outstripping supply. This is threatening natural, biodiverse forests in Europe, Eastern Russia, and North America, and grasslands, farmlands and in some cases forests in West Africa and South America.

Prices domestically and globally are also rising for wood.

According to the United Nations Economic Commission for Europe, this means that countries and industries are increasingly looking for cheap markets, which are found in countries with fragile rainforests in Southeast Asia and South America.[9]

In essence, forests are being lost either directly or indirectly due to the burden that new large-scale developments like this one are putting on virgin wood.

How will the fuel be transported?

- Fuel would be transported primarily by sea via Barrow Port.

- Centrica proposes to transport fuel by rail – and new routes would have to be built. There are two possible routes for rail access to the site: either by a new line, which would connect to the Network Rail line at or around the location of the existing junction with the line to Barrow Port, and would involve widening the bridges or constructing new bridges;[10] or by a new line taking a spur off the Network Rail line from Lancaster.

- Finally, if waste wood is used, this will be transported by road. Waste from the site will also be removed by road.

What are the health concerns due to Air Quality Impacts?

Pollution puts lives at risk

It is highly likely that this development will adversely affect air quality, putting people's health (and that of surrounding protected areas) at risk. The UK's Environmental Audit Commission estimates that each year in the UK, 50000 people die prematurely due to poor health from pollution. [11] The main sources of pollution are traffic and heavy industry, and biomass power stations are one of the most polluting of all the heavy industries.

[8] 'Oven dried tonnes' is technical way that wood can be counted, referring to the net weight of the wood if you were to extract the moisture from it. In real terms, the true weight of the wood is more than this because it contains a certain amount of moisture – usually 50-60% for conifers. Any reference to 'green wood' means that the moisture content has been included in the weight.

[9] UNECE, 'Economic crisis drives UNECE region wood harvest to an all-time low' 5 August 2010, available at http://www.unece.org/press/pr2010/10tim_p12e.html

[10] For more information on locations of bridge reconstruction, see Centrica, 'Roosecote Biomass Power Station: Environmental Impact Assessment Scoping Report', p 11

[11] House of Commons: Environmental Audit Committee Report, 'Air Quality' (March 2010), available at http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenvaud/229/229i.pdf

Biomass a heavy polluter

According to the US Partnership for Policy Integrity, based on figures published by the US Environmental Protection Agency, biomass combustion is approximately as polluting as coal burning, but releases more nitrogen oxides and small particulates (Pms), Pollutants that typically arise from biomass power stations are:

- **Oxides of nitrogen (NOx):** can affect lung metabolism, structure, function, inflammation and host defence against pulmonary infections .

- **Small Particulates (PMs):** PM exposure affects the respiratory and cardiovascular systems in children and adults and extends to a number of large, susceptible groups within the general population. According to the World Health Organisation and the EU, there are no safe levels of exposure to the smallest particulates – any exposure can be harmful. Centrica has not indicated how it will filter out these particles. But the common filter of choice – the bag filter – is less effective against the smallest of Small Particulates (PM 2.5s), which are particularly dangerous for human health ('PM 2.5').

- **Sulphur Dioxide**: High levels result in breathing problems for asthmatic children, and shortness of breath.

- **Heavy Metals and Dioxins and Furans**: Toxic and carcinogenic to human health. Particularly prevalent when using chemically treated or toxic waste wood, but, even 'clean' untreated wood can contain high concentrations of heavy metals.

How bad is pollution from biomass?

Centrica are yet to publish an air quality assessment. Yet even with the best available mitigation (and we do not yet know whether Centrica would pay for that), biomass power stations still emit large quantities of pollutants, including nitrogen oxides and small particulates. In the US state of Vermont, a 50MW biomass power station, using the best technology available for reducing pollution and burning only 'clean wood' is nonetheless the single biggest source of air pollution in the state.[12]

Current pollution trends in Barrow in Furness

The only pollutant being monitored in Barrow-in-Furness Council is Nitrogen Dioxide. There is no monitoring of PM10, SO2, or Benzene concentrations being carried out by Barrow-in-Furness Council.[13] In terms of NO2 levels: In 2007, there was 'Concern over Nitrogen Dioxide levels near gas terminal/ gas power station boundary.'[14] It is worth noting in this vein that biomass is far more polluting than gas, with gas considered as 'clean' compared to biomass, according to Environmental Protection UK.[15] In 2010, there was a 'Downward trend but increase in background level of Nitrogen Dioxide.'

Human and financial cost?

The previous UK Government commissioned data which showed that the air quality damage in terms of an increase in particulate emissions from biomass could result in the loss of up to 1,175,000 life years in 2020, costing the Government £557 million – just from small particulates.[16]

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[12] Map available at Planet Hazard Website, http://www.planethazard.com/phmapenv.aspx?mode=topten&area=state&state=VT

[13] Barrow in Furness Borough Council, 'Air Quality Review and Assessment Progress Report' (2011), available at http://www.barrowbc.gov.uk/pdf/Progress%20Report-%20%20Final%20Version%20%28uploaded%2014.7.11%29.pdf, page 12

[14] Ibid, page 5

[15] Environmental Protection UK, 'Biomass and Air Quality Guidance for Local Authorities England and Wales' (June 2009), available at http://www.environmental-protection.org.uk/assets/library/documents/Biomass_and_Air_Quality_Guidance.pdf, page 19

[16] UK Parliament Website, 'Memorandum', available at http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenvaud/memo/airquality/uc0102.htm

Will there be an impact on Nearby Nature Sites?

Cavendish Dock is considered to be ecologically sensitive, and within 2km of the site are the following sites of natural interest:

• Morecambe Bay SPA, SAC and Ramsar site,

• Duddon Estuary SSSI, SPA and Ramsar site, and

• South Walney and Piel Channel Flats SSSI.

The developer writes that the development will be positive for Cavendish Dock. Hot water will be discharged into Cavendish Dock: there will be an anticipated temperature difference between the water inlet and outlet anticipated at around 10-15 degrees.[17] As mentioned above, we would question the integrity of justifying wasting up to 75% of the energy produced as heat on the basis that it will support the local ecology, and note that a peer-reviewed study about marine life at Cavendish Dock shows that the existing gas power station has had no impact at all on the fish species studied.

We also note with concern that some of the pollutants from the Biomass Power Station may adversely impact on the ecology of the surrounding area: A search on the Air Pollution Information System Database shows that there are high levels of ammonia on the site and that in parts of Morecambe Bay, the levels of ammonia are above the critical levels to support wildlife in the area.[18]

Traffic levels: The scoping report does not say what the traffic implications will be. This will in part depend on whether the fuel is delivered fully by sea or in part by road, which has not yet been established. As a minimum, there will be 40 lorry loads per week to transport the fuel to the site, if all of the fuel arrives by sea. Lorries will also be used to remove the waste (mainly ash, much of it toxic) from the site.

Will the development create new Jobs?

Centrica claim that during operation, 50 full time operational and maintenance staff are expected to be employed, although another company (Forth Energy) predicts that only 40 full-time staff are needed for a larger, 100 MW power station. Many of the jobs are likely to be low-skill, low-pay ones involving wood handling.

On the other hand, the wood panel industry has warned that large-scale biomass threatens 8,700 UK jobs, jobs which will be lost since wood will be burned rather than processed.[19]

Finally, it is worth considering that the jobs in biomass power stations are heavily subsidized through Renewable Obligation Certificates. This power station is likely to attract £46 million in subsidies. This means that each full time job created is costing the public at least £900,000 to subsidise.

What are the health and safety concerns to do with storing biomass?

The storage of large quantities of biomass on site poses a health and safety risk in case the biomass spontaneously catches fire. In October 2011, at Tyneside Port, 25 tonnes of wood at a biomass storage facility caught fire, out of a total stored pile of 200 tonnes. The blaze took 40 firefighters to attend, and lasted 12 hours. The firefighter on duty told the press, 'Large piles of combustible material are prone to self-ignite,

[17] Centrica, 'Roosecote Biomass Power Station: Environmental Impact Assessment Scoping Report,' p 7
[18] Based on a search for ammonia and N Deposition levels at Gris Reference SD330760 on the APIS website: http://www.apis.ac.uk/. Levels of N Deposition were 17.5 kg N/ha/year, when the threshold is between 5-10kg per year. Concentration of ammonia were 1.1 µg/m3, when the thresholds are between 1-3 µg/m^3.
[19] Make Wood Work, 'Large-scale biomass threatens 8,700 UK jobs... and risks a 1% increase in UK emissions', 28 June 2010, available at http://www.makewoodwork.co.uk/DDT_Show_Entry_1F_news_feed.asp?GalleryName=Latest_News&EntryID=617&ImageSeqNo=1

because heat builds up within the pile and has nowhere to escape. That is what has happened here, the wood spontaneously combusted.'[20]

Far more than 25 tonnes of wood would need to be stored at Roosecote if the power station was built. According to the US Government's Occupational Safety & Health Administration: "Combustible dusts, including wood dust, are fine particles that present a potentially catastrophic explosion hazard when suspended in the air in certain conditions. Since 1980, more than 130 workers have been killed and 780 injured in combustible dust explosions in a variety of industries across the nation."[21] Biomass explosions and fires have been reported from different countries with biomass power stations, some of them causing injuries and deaths. For example, a recent dust explosion at RWE's 750,000 wood pellet factory in Georgia, US was reportedly felt by residents 5 miles away.[22]

This is clearly a very significant risk which seems to have been overlooked by the Scoping Report.

Is biomass Carbon Neutral?

Although Centrica is keen to brand this venture as climate friendly, studies show that the climate impact of cutting large numbers of trees for bioenergy and of converting natural ecosystems to plantations to burn is worse than that of generating the same amount of electricity from burning coal over a period of decades and possibly centuries. This is because burning wood produces an immediate release of carbon into the atmosphere, which can take many decades or even hundreds of years to be replaced through forest regrowth – by which point it will be too late to tackle climate change. This carbon debt is ignored by Developers and is not factored into their carbon emissions savings calculations.

We draw your attention to 2 recent publications in this regard:

(a) *The European Environment Agency's Scientific Committee's Opinion of 15 September 2011:* In this publication, the Scientific Committee found warned that due to the Carbon Debt caused by biomass, biomass from certain sources 'may even result in increased carbon emissions – thereby accelerating global warming.'[23]

(b) *The Committee on Climate Change's Bioenergy Strategy Review of December 2011.* The Committee, which advises the UK on climate change, warned against electricity-only biomass power stations. It noted that because there were limits to the global supply of bioenergy, it could only be deployed if Carbon Capture and Storage was available. It noted that if Carbon Capture and Storage technology was not available, bioenergy use should not be used for electricity generation.[24]

Developers must not be permitted to rely on the image of forests as carbon sinks to legitimise their destruction and combustion – if anything, it should be all the more reason for their protection. Forests play a vital role in regulating the Earth's climate system, including the carbon and rainfall cycle and thus weather patterns – destroying them for bioenergy will make it less likely that the climate can ever become stable again.

[20] The Journal, 31 October 2011, 'Firefighters battle huge biomass fire at Port of Tyne', at http://www.journallive.co.uk/north-east-news/todays-news/2011/10/31/firefighters-battle-huge-biomass-fire-at-port-of-tyne-61634-29689277/

[21] Reliable Plant, 'OSHA cites Maine pellet mill for combustible dust and other hazards,' available at http://www.reliableplant.com/Read/23313/OSHA-cites-Maine-pellet-mill

[22] Renewables International Magazine, 'Following explosion, world's largest pellet plant resumes operation', 15 July 2011, available at http://www.renewablesinternational.net/following-explosion-worlds-largest-pellet-plant-resumes-operation/150/515/31440/

[23] European Environment Agency Scientific Committee, 'Opinion of the EEA Scientific Committee on Greenhouse Gas Accounting in Relation to Bioenergy' 15 September 2011, available at http://www.eea.europa.eu/about-us/governance/scientific-committee/sc-opinions/opinions-on-scientific-issues/sc-opinion-on-greenhouse-gas

[24] The Committee on Climate Change, 'Bioenergy Strategy Review' (December 2011), available at http://www.theccc.org.uk/topics/bioenergy

The bottom line: it's all about the money

If Centrica gets the go ahead, they will be able to claim around £46 million in public money every year, paid through a national levy on electricity bills (Renewable Obligation Certificates). With this amount of money available, it is no wonder that they are investing time and effort into claiming that the Power Station is green.

Bad for the climate, forests, and health? How to have your say:

Because of the size of this development (over 50MW), The Infrastructure Planning Commission, a ***central government body***, will determine whether this project gets the go ahead. Barrow Borough Council and Cumbria County Council are ***statutory consultees***, meaning they have an important say but do not have the ultimate authority to decide.

How the procedure works.

1. ***Pre-examination:*** November 2011: Centrica submitted a 'Scoping Report' which provides rough details of its plans which we have referred to here. This can be accessed at http://www.centrica.com/files/pdf/centrica_energy/Roosecote_Environmental_Impact_Assessment_Scoping_Report.pdf

2. ***Developer will submit an application:*** From May 2012: Centrica will submit a **full application** to the Infrastructure Planning Commission (IPC). The IPC is the central government body which will decide on whether to grant the application planning permission.

3. ***IPC decides whether to accept the application:*** Within 28 days of the full application: The IPC will decide whether to accept the application.

4. ***Pre-examination:*** Once the IPC decides whether to accept the application, which it probably will unless there are serious problems, the application goes to the 'pre-examination' stage. At this point, you must **register to have your say on the development** with the IPC. For more information on having your say with the IPC, see http://infrastructure.independent.gov.uk/wp-content/uploads/2011/02/Advice-note-8.3-web.pdf. The pre-examination stage takes around 3 months.

5. ***Examination:*** The IPC has 6 months to decide on the application.

6. ***Decision***. The final decision is handed down.

If the Councils object, this will constitute material planning considerations – so it is crucial that the Councillors are given the opportunity to find out about the concerns with the development.

Please raise as much awareness around this destructive project and together we can prevent it from going ahead.

For more information about this briefing, contact us at biofuelwatch@ymail.com

20 January 2012