Biomass FAQ

Does biomass burning destroy forests? How?

On the current scale that we are demanding biomass, yes – and as demand rises, it will soon destroy forests on a far a greater scale than today. Currently, around 1.5 million tonnes of biomass is co-fired with coal and the great majority of that is imported. Drax burns by far the most biomass for electricity in the UK. Another 2.9 million tonnes of biomass are burned for electricity. Most of that is from the UK but much of it is chicken litter, sewage sludge and other residues which are in limited supply. There is no doubt that the vast new demand being created will be met first and foremost from imported wood. Demand for biomass is skyrocketing, with over 40 power new power stations proposed across the UK. Biofuelwatch has estimated that demand is set to increase to around **60 million tonnes of wood per year in the United Kingdom**, if all proposed power stations are granted planning permission. We currently have less10 million tonnes of wood available in the UK for use across all wood industries. So the position is that the UK's demand through schemes such as this one will be encouraging an increase in logging of wildlife-rich forests abroad as well as new monoculture tree plantations, many of them at the expense of forests and the people who depend on them.

NGOs RSPB and ClientEarth have produced helpful reports on this topic.[1]

Does biomass pollute? How does this affect health and the environment?

Yes. Biomass Power Stations emit harmful pollutants into the atmosphere, and is considered to be as bad as using burning oil and worse than burning gas according to Environmental Protection UK.[2] According to the Partnership for Policy Intergrity, biomass combustion releases as much CO2 as coal, and even more nitrogen oxides and small particulates (PMs) than coal.[3]

These are some of the effects of the pollutants released by biomass combustion on human health:

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

- **Carbon monoxide (CO):** inhibits the blood's ability to carry oxygen to vital organs such as the heart and brain.

- **Particulates**: 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. There are no safe levels for small particulates PM2.5, meaning that the slightest emissions of PM2.5 from the power station would harm health.

- **Sulphur Dioxide:** Can 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.

According to a 2010 report by the UK's House of Commons Environmental Audit Committee, up to 50,000 people a year may already be dying prematurely each year due to exposure to polluted air.[4] 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.[5]

---

1 RSPB Report, 'Bioenergy: A Burning Issue' (September 2010), available at *http://www.rspb.org.uk/Images/Bioenergy_a_burning_issue_1_tcm9-288702.pdf* ; ClientEarth et al, 'Woody Biomass for Energy: NGO Concerns and Recommendations' (April 2011), available at *http://www.fern.org/sites/fern.org/files/NGO%20Report%20on%20Biomass%2011%20April%202011.pdf*

2 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*

3 Partnership for Policy Integrity, 'Air pollution from biomass energy (updated April 2011)', available at http://www.pfpi.net/air-pollution-2

4 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

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

Does biomass produce carbon dioxide? Is it as bad as fossil fuels?

YES, it produces carbon dioxide. Per unit of energy, smokestack CO2 emissions from biomass power stations are around 50% higher than those from coal power stations.

But isn't biomass carbon neutral?

Developers like to say that burning biomass is carbon neutral, because the wood burned absorbed carbon dioxide from the atmosphere as it was growing. But the reality is that because biomass contains carbon, naturally, when it is combusted, it releases all of that carbon dioxide into the atmosphere. This carbon debt is only paid back if and when a tree or crop is fully grown to replace what was chopped and if soils and other vegetation destroyed or harmed during logging re-absorb all the carbon they had lost. This may take decades and even centuries. What's more, there is no obligation on developers to replant what they have harvested, and when forests and other natural ecosystems are too damaged to recover or, yet worse, turned into monoculture tree plantations, the carbon emitted in the process will never be re-absorbed.

Currently, biomass is also considered to be 'carbon neutral' by the UK Government. The result of this is that developers produce figures which show carbon emissions savings, which are overlook the actual carbon that is release into the atmosphere. The European Environment Agency Scientific Committee recently warned the assumption that biomass is carbon neutral is a 'serious accounting error' and that using biomass can result in increased carbon emissions and thereby accelerate global warming, and recommended that governments must rectify this situation as soon as possible.[6]

International NGO Birdlife International (of which the RSPB is a member), released a helpful report on the carbon debt produced by biomass.[7]

Aside from the carbon emitted when biomass burns, importing biomass from across the world produces emissions from transporting and processing the fuel as well. And healthy forests play a major role in regulating the rainfall cycle, storm tracks and the nitrogen cycle, too, all of which are vitally important for a stable climate.

What if developers promise to only source 'sustainable' or 'certified' wood?

There are certain wood certification schemes, such as the Forest Stewardship Council (FSC) which are supposed to ensure that wood is sourced sustainably. But promises to source certified wood will not ensure that the power station is green, because:

- It will be very difficult to monitor whether developers stick with such claims. If it is granted planning permission, it could always just switch to an uncertified supplier. For example, another company planning biomass power stations in Tyne, MGT Power, stated in their planning application that they would burn mainly wood from North America and, once they got permission announced an agreement to buy all or most of the wood from eucalyptus plantations in Brazil, from a company implicated in the destruction of rainforests and savannah and in serious land conflicts.

---

6 European Environment Agency Scientific Committee, 'Opinion of the EEA Scientific Committee on Greenhouse Gas Accounting in Relation to Bioenergy' (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*

7 Birdlife International et al, 'Bioenergy: A Carbon Accounting Time Bomb', available at *http://www.birdlife.org/eu/pdfs/carbon_bomb_21_06_2010.pdf*

- The FSC itself has come under a lot of criticism for failing to adequately ensure compliance with any of its criteria. It has for example certified wood from illegal logging, from tree plantations where large numbers of baboons are being shot by the company in question, from a plantation in Brazil found by a court to have been illegally set up at the expense of native forests and communities' land rights, from the destruction of old-growth forests and from plantations linked to serious human rights abuses. In short, FSC, like all other wood certification, is effectively meaningless. [8]

- Even if forest certification could guarantee compliance with basic standards – which is highly improbable, it would still be meaningless. The biggest problem with biomass on such a massive scale is that it is placing more demand for wood than the planet can supply, so 'certified' wood can never address this issue.

What are scientific experts' positions on biomass?

European Environment Agency Scientific Committee: (agency of the European Union devoted to the monitoring of the European environment)

On 15th September 2011 it published a report which stated that the assumption that biomass is carbon neutral is a 'serious accounting error' and that using biomass can result in increased carbon emissions and thereby accelerate global warming, and recommended that governments must rectify this situation as soon as possible.[9]

UK Committee on Climate Change: (independent body which advises the UK Government on tackling and preparing for climate change)

In its Bioenergy Strategy Review of December 2011[10], it stated:

- That it was largely against new electricity-only biomass power stations

- It noted that biomass was not carbon neutral: 'In practice, bioenergy is not carbon neutral as GHG emissions of CO2, methane (CH4) and nitrous oxide (N2O) are produced across the entire supply chain from the planting of the crop, through to its fertilisation and growth, processing and transportation (Figure 1). Land use change emissions – both direct and indirect – can be significant, especially where there is conversion of carbon-rich land. In the worst cases, combined emissions along the chain can exceed those of fossil fuels.'

- Under the Kyoto Protocol of the United Nations Framework Convention on Climate Change, bioenergy emissions should be included in the annual carbon accounts of the country in which the bioenergy feedstock was harvested. Hence, bioenergy emissions should be reflected in the Land Use, Land Use Change and Forestry (LULUCF) or agriculture inventories rather than the energy inventory. In practice, a large proportion of these emissions are not being captured in the inventories or elsewhere.

---

8 For more details, see FSC Watch, at *http://www.fsc-watch.org/*

9 European Environment Agency Scientific Committee, 'Opinion of the EEA Scientific Committee on Greenhouse Gas Accounting in Relation to Bioenergy' (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*

10 Climate Change Committee, 'The Renewable Energy Review' (May 2011), available at *http://hmccc.s3.amazonaws.com/Renewables%20Review/The%20renewable%20energy%20review_Printout.pdf*

- However, the CCC stated that in order for the UK to meet its Renewable Energy targets, it would have to increase its use of biomass – but only if Carbon Capture and Storage was available as a technology. Biofuelwatch's response to this recommendation can be found at http://www.biofuelwatch.org.uk/wp-content/uploads/CCC-Press-Release1.pdf

Environment Agency

- Is a bit conservative and is sitting on the fence. It takes the view that GHG emissions are generally, but not always less than fossil fuels.[11] But it does note that biomass is currently very inefficient and that transporting fuels over long distances can reduce emissions savings up to 50%.

What are industries' positions on biomass?

Developers stand to gain lots of money, so they claim it is green, clean, and provides jobs. Note that developers British Sugar, Drax. E.ON, Future Biogas, Estover Energy and RES Group have launched a campaign to try to get the UK Government to provide even more support to biomass. This call has been endorsed by the Renewable Energy Association, the body which represents renewable energy producers in the UK.

On the other hand, UK timber industries such as the Wood Panel Industries Federation and the Confederation of Forest Industries have strongly warned against the steeply increased demand for biomass from the UK, because it will push up timber prices, make UK industries that depend on wood unviable, thus destroying far more jobs than created through bioenergy (and ensuring that virtually all other wood and paper are sourced from abroad in future).[12] Although it is good that they are raising concerns about the impacts of biomass locally, what is concerning is that they do not seem to have a problem with importing biomass from further afield, where forests, other ecosystems and communities will suffer.

What is the UK Government's position on biomass?

It wants to continue to subsidise biomass, and has proposed as much under the current consultation on the banding levels for different renewable energies. The government effectively is concerned about how much money can be offered to different industries but is not considering any of the sustainability concerns surrounding biomass.

How efficient is biomass?

Electricity from biomass is **extremely inefficient**. Even DECC notes that biomass power stations today are only 25% efficient, with 75% of the energy potential of the fuel wasted.[13] At best, 30%

---

11 Environment Agency, 'Biomass: Carbon sink or carbon sinner?' (April 2009), available at *http://www.environment-agency.gov.uk/static/documents/Leisure/Biomass__carbon_sink_or_carbon_sinner_summary_report.pdf*

12 CONFOR and Wood Panel Industries Federation, 'Wood fibre availability and demand in Britain 2007 to 2025' (May 2010), available at *http://www.confor.org.uk/Upload/Documents/37_WoodFibreAvailabilityDemandReportfinal.pdf*

13 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*

efficiency is reached. Note that under EU law, the UK is meant to be promoting biomass technologies which provide at least 70% efficiency rates.[14]

If developers promise to supply biomass as heat as well as electricity, does this make them more efficient and therefore green?

The energy produced from a biomass power station is heat, which is then converted into electricity. As mentioned above, currently biomass is very inefficient, with most of the heat being lost. Developers are often keen to demonstrate that they will make use of the heat as well as the electricity from biomass. However:

- This does not automatically mean that the biomass is environmentally friendly, as **other environmental concerns remain**. That developers might supply heat will not undo the fact that they will source their wood from across the world, cause massive transport emissions, increased carbon emissions from combustion, pollution, and will impact on the local natural environment.

- Often promises to supply heat are in fact **unsubstantiated** and no more than PR stunts. They rely on there being in place district local heating networks, which are currently underdeveloped across the UK and which require a lot of investment. Given the cuts, there is little chance of local authorities being able to pay for heat distribution and developers rarely promise to do so either.

- It is also worth questioning how **much heat** developers intend to supply. If it is a small fraction of the overall megawattage capacity of the plant, then it won't necessarily make the plant that much more efficient. Recall that EU law recommends that Biomass power stations achieve 70% efficiency ratings. The UK's 'Combined Heat and Power Quality Assurance Standard 2009' also provides that power stations 25 MW and above must achieve 70% efficiency in order to constitute 'good quality CHP'. In the face of this, hoevere, the UK Government decided not to apply this requirement for the purpose of the Renewables Obligation and instead to class biomass power stations of any size with just 35% efficiency as CHP eligible for a higher subsidy rate (Guidance Note 44 (Use of CHPQA) to obtain Renewables Obligation Certificates (ROCs) Including Under a Banded Obligation 2008). This is a policy decision which appears to be quite incompatible with the Renewable Energy Directive position.

But there are sustainability criteria now for biomass. Will these ensure that the biomass is 'sustainable'?

Yes, there are sustainability criteria, which can be accessed on DECC's website and which the Government states they intend to introduce from 2013.[15] But they are grossly inadequate and cannot ensure that biomass is sustainable because:

---

[14] EU Directive 2009/28/EC ('Renewable Energy Directive'), Article 13(6), available at *http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF*

[15] DECC Website, 'Sustainability standards for biomass', available at *http://www.decc.gov.uk/en/content/cms/meeting_energy/bioenergy/sustainability/sustainability.aspx*

- It is difficult to verify the data on sustainability, because companies only have to pay a consultant to fill in a form stating that sustainability criteria are met, without any external auditing. This is an invitation to fraud. And even if companies intend to be honest, many will have to buy wood on the open market, without knowing where exactly it comes from themselves.

- Proposed sustainability criteria do not address any adverse human rights effects that are associated with sourcing biomass, such as land grabbing and human rights abuses by companies establishing monoculture plantations, which has been well documented in the case of tree plantations in the Global South.

- The sustainability criteria require that biomass installations provide 60% greenhouse gas emissions savings as compared with fossil fuels, but this figure is based on flawed, outdated maths which presumes that biomass is carbon neutral. The presumptions behind the figures have been criticised by the European Environment Agency Scientific Committee and the Committee on Climate Change, so this emissions savings figure is a false target.

- The sustainability criteria require that biomass does not come from primary forests, but they do not take into account any indirect land use change impacts that biomass might have; i.e. the fact that biomass suppliers may displace other users of land into such forests and other high value land ecosystems with high biodiversity. So, say, for example, a developer sources wood from an existing tree plantation than a forest. This new demand will then force or displace other users of wood who previously used wood from the plantation to cut down more forests or convert more biodiverse grasslands or people's farmland for new tree plantations. This phenomenon, called indirect land use change, is a massive source of controversy in the EU and the UK. Scientists and governments have acknowledged that time and again that if we take into account emissions from indirect land use change, bioenergy can have devastating carbon emissions and human rights impacts.

  However, despite 3 years of loud calls for these emissions to be accounted for, and despite a legal obligation on the EU to revise a system to account for emissions from indirect land use change, governments remain unprepared to fix this problem. A letter by nearly 200 scientists recently reiterated this massive and urgent problem, noting that the laws 'do not currently account for these emissions in their lifecycle analysis or elsewhere, giving biofuels credit for greater carbon savings than actually achieved.'[16]

- The sustainability criteria do not address the fact that demand for biomass needs to be matched by adequate supplies, and that demand on the scale that we are seeing now leads to deforestation.

---

16 'International Scientists and Economists Statement on Biofuels and Land Use: A Letter to the European Commission' (7 October 2011), available at *http://www.ucsusa.org/assets/documents/global_warming/International-Scientists-and-Economists-Statement-on-Biofuels-and-Land-Use.pdf*

So in sum, if your idea of 'sustainability' is unverified reporting within a system which allows for flawed accounting for carbon emissions, a complete disregard of human rights concerns, and a system which encourages unsustainable demand, then yes, please refer to the UK's sustainability criteria for biomass.

What other power stations exist at the moment?

If approved, it will be one of the larger ones, but not the largest one, in the country. This is Biofuelwatch's data on the large biomass power stations that exist at the moment:

Name	MW	Tonnes	Sourcing
Cottam Power Station	20 biomass	115000	olive residues, wood
Drax Power Station	220 biomass	1068803	mainly imported wood, plus residues and some UK SRC
Elean Power Station	38	220000	Straw
Fiddlers Ferry Power Station	26 biomass	93 095	mainly olive plus other residues, incl.palm kernel; some miscanthus
Irvine Paper Mill CHP Plant	26	380000	virgin and waste wood, paper sludge
Slough	35	385 000	around 3500 tonnes per week virgin biomass plus 3500 tonnes per week recycled wood fibre
Steven's Croft	50	343696	Scottish wood, including virgin timber
Thetford Power Station	42	413 802	mainly chicken litter, some horse bedding and wood
UPM Shotton Paper Burner	20	449000	wood and papermill sludge
Wilton 10	35	291847	domestic virgin and waste wood

What about other campaign efforts around the country? Have they been successful?

There are several other campaigns in the UK at the moment.

One which achieved success was the Coed Bach, which campaigned to oppose the building of a 50MW biomass power station at Coedbach Washery Site, and a 50MW power station at King's Dock in Wales.[17]

There is a very strong movement against a 200MW power station in Leith, Edinburgh, which has successfully delayed the process, but the outcome of that decision has yet to be determined.[18]

There are also campaigns in Trafford, near Manchester, against a 20MW power station,[19] and a new Isle of Wight campaign[20], to name a few

Why is biomass classified as 'renewable energy'?

Around ten years ago, new thinkers really thought that biomass and biofuels could be the energy for the future. The idea of 'renewability' was that you can harvest trees and regrow them. This myth

[17] See *http://coedbach.webs.com/*

[18] See *http://www.noleithbiomass.org.uk/*

[19] See *http://www.breathecleanairgroup.co.uk/*

[20] www.wightbiomess.com

has long been disproven. In reality, large-scale industrial biomass burning is a particularly polluting form of energy harmful to forests, people and the climate.

However, according to the law, under the EU Renewable Energy Directive, biomass is an eligible source of renewable energy which can be subsidised and promoted on an unprecedented scale.

Biomass therefore is also classified as renewable energy in the UK, and currently accounts for 82.5% of the UK's so called 'renewable energy'.[21] In reality, biomass allows energy companies to attract vast subsidies for dirty energy falsely classed as 'renewable', rather than having to invest in genuinely renewable energy such as sustainable wind and solar power.

Why and how is biomass subsidised?

The United Kingdom government has a target to provide 15% renewable energy by 2020, and is bound by EU law to do so. One of the ways to make sure that it provides renewable energy is to offer financial incentives to electricity suppliers. It has done this through the Renewable Obligation Order. Under the order, suppliers are obliged to supply a percentage of their electricity from renewable, which increases year on year. This year, it's 12.4%.

However, suppliers can buy and sell their way out of this requirement. Renewable energy suppliers can 'sell' their surplus renewable energy to fossil fuel suppliers who have not met the 12.4% target.

For each megawatt of renewable electricity provided, suppliers gain a number of 'Renewable Obligation Certificates' ('ROCs'). The number of ROCs per megawatt varies, depending on which renewable technology is used (see table below). ROCs have a market value which is around £48 at the moment.

The ROC scheme is financed not by the public purse, but through a tariff which comes off of our electricity bills.

Effectively, the ROC trading scheme operates to heavily subsidise energy companies. For biomass, what it means is that we are paying more expensive electricity bills to finance more carbon emissions, more deforestation, land grabs, and increased global food prices.

The UK Government is consulting on ROCs and is due to put its proposals on the table in mid-February. The table summarises what has been proposed by the UK Government:

Proposed biomass ROC banding from April 2013:

Standard co-firing (up to 15%)	*0.5 (no change)*
Co-firing with CHP or energy crops	*1 (no change)*
Co-firing with CHP and energy crops	*1.5 (no change)*
Enhanced co-firing/conversion (15% and above)	*1 (new incentive for co-firing 15% or more biomass with coal)*

[21] DECC Report, 'Digest of United Kingdom Energy Statistics 2011: Chapter 7: Renewable sources of energy', available at *http://www.decc.gov.uk/assets/decc/11/stats/publications/dukes/2309-dukes-2011-chapter-7-renewable-sources.pdf*, page 190

Coal to biomass conversion (complete, not cofiring)	*1 (1.5 at present)*
Dedicated biomass (i.e. biomass only power plants)	*1.5 (as at present) until April 2016, then 1.4*
Dedicated biomass with CHP	*2 (as at present) until April 2015, then 1.5*
Energy crops burnt in dedicated biomass plants	*2 (as at present) until April 2015, then 1.9 until April 2016, then 1.8*
Anaerobic digestion (biogas)	*2 (as at present) until April 2015, then 1.9 until April 2016, then 1.8*
Energy from waste with CHP	*0.5 (down from 1)*
Advanced pyrolysis and gasification of biomass and waste	*2 (as at present) until April 2015, then 1.9 until April 2016, then 1.8*
Standard pyrolysis and gasification of biomass and waste	*0.5 (down from 1)*
Electricity from landfill gas	*No future ROCs (0.25 at present)*