

To the UK Department of Energy and Climate Change

End support for Drax power station: *stop harmful subsidies for biomass electricity and phase out coal units*

Drax power station, the biggest carbon emitter in the UK, has converted two of six units to burn wood pellets in place of coal, with plans for a possible two further conversions. Under the guise of renewable, low-carbon energy generation, Drax is receiving vast support to do this. In 2016 alone, Drax stands to receive around £660 million in subsidies. [1] These subsidies, in the form of Renewable Obligation Certificates, a Contract for Difference, and a Treasury Public Loan Guarantee, make Drax's biomass operations very profitable, and allow Drax to comply with the EU's Industrial Emissions Directive. Without subsidies and support for Drax's biomass conversion, the power station would have faced closure. [2]

Drax Biomass

With three converted units, Drax would require around 7 million tonnes of pellets every year. [3] The vast majority of the wood that Drax burns is imported from the southern US and Canada, with imports expected to increase significantly as new pellet facilities begin production. Even at the early stages of the growth of this industry, whole trees are being turned into pellets, with a significant proportion of Drax's biomass sourced from biodiverse hardwood forests in the southern US. [4] [5]

In its recent biomass sourcing report [6], Drax insists it uses predominantly 'forest residues' and 'thinnings'. However, on-the-ground research in the southern US shows that much of the biomass being sourced and falling within these categories is very large material, including whole trees cut from mature hardwood forests. This has serious impacts on biodiversity, and means that the carbon emissions quoted by Drax are likely to be seriously underestimated.

On top of this, if evidence collected on wood sourcing for Drax's largest pellet supplier, Enviva, is applied to DECC's own recently published BEAC biomass carbon calculator, it can be shown that a significant proportion of wood that Drax burns results in up to 3 times more carbon emissions than equivalent generation from burning coal. [7] Drax is currently getting away with reporting substantial carbon emission reductions because of a flawed carbon accounting methodology. Drax's carbon accounting relies on the Ofgem Solid and Gaseous Biomass Carbon Calculator (B2C2) - a framework that does not account for changes in the carbon stock of the forest, foregone carbon sequestration of land, or indirect impacts on carbon stocks in other areas of land. [8]

The impacts of Drax's future sourcing are likely to be felt in other areas, too. The Brazilian company Tanac SA has reported entering into a sourcing agreement with Drax which will see the company build a large pellet plant and which is likely to result in the expansion of monoculture tree plantations in the Brazilian state of Rio Grande do Sul. [9] Monoculture tree plantations in Brazil are associated with the displacement of indigenous and traditional communities, deforestation, water and soil depletion, and pollution. [10]

Mounting evidence and opinion from the scientific community [11] shows that the carbon intensity of biomass electricity, and the carbon debt that is created when it is burned, must be fully accounted for. These important factors must now be reflected in policy and eligibility for renewable energy subsidies. The question is, how many biodiverse forests will be turned into CO₂ before this happens?

Drax Coal

Drax's partial biomass conversion allows it to keep its remaining coal units open by lowering the plant's overall sulphur dioxide emissions, and therefore complying with the EU's IED. [12] Without biomass, it would be increasingly hard for Drax to remain operating post-2016, and would likely have resulted in the plant's closure. Biomass burning is therefore extending coal burning into the future.

If Drax converts 3 units to biomass, it will still be burning as much as 4 million tonnes of coal a year. [13] This is a significant proportion of the UK's overall coal use, and is incompatible with recent party pledges to phase out unabated coal burning. [14] If we are to have any hope of avoiding the worst impacts of climate change, we have to leave remaining fossil fuels in the ground. This means phasing out Drax's remaining coal units as quickly as possible. However, in contradiction to this, Drax will receive a direct subsidy in the form of Capacity Market payments on two of its operating coal units, which will only make the continued burning of coal at Drax more profitable.

Drax's coal has serious implications for communities across the globe, as well as the carbon emissions it is responsible for. For example, Drax burns coal from Colombia, [15] where communities have been violently displaced for coal mining operations, and continue to be impacted by the environmental and health implications of the huge mines. [16] If the UK is to take its climate change and human rights responsibilities seriously, then coal burning at Drax must end.

In Conclusion

Subsidising the burning of biomass and coal at Drax, and the substantial environmental, human rights and climate impacts of its operations, must cease. Energy-related subsidies should be spent on measures that reduce overall energy use, such as conservation and energy efficiency, and on genuinely low carbon and sustainable forms or renewable energy, such as sustainable wind and solar power.

We request that DECC halt subsidies for Drax's existing biomass capacity, commit to halting supports for further biomass unit conversions, and work towards the earliest possible phase out of its coal units.

Signed by:

Biofuelwatch, UK/US

Dogwood Alliance, US

Fern, EU

NRDC, US

Coal Action Network, UK

Econexus, UK

Center for Biological Diversity, US

Global Justice Ecology Project, US

London Mining Network, UK

Colombia Solidarity Campaign, UK

Global Forest Coalition, Int

World Rainforest Movement, Int

Centre for Alternative Technology, UK

Fuel Poverty Action, UK

Campaign Against Climate Change, UK

People & Planet, UK

The Gaia Foundation, UK

Operation Noah, UK

The Corner House, UK

Reclaim the Power London, UK

Time to Act, UK

Occupy London, UK

Occupy Environment Working Group, UK

Comisión de Justicia y Paz de Colombia

Comunidades Construyendo Paz en los Territorios, CONPAZ

Comité Ambiental en Defensa de la Vida, Tolima, Colombia

References and notes

[1] Subsidy forecasts are Biofuelwatch estimates based on the average market price per ROC for the last 12 months, current electricity wholesale prices, and the assumption that running on biomass, each Drax unit will run at 630 MW capacity (which could be an underestimate):

- One unit conversion to be subsidised through a Contract for Difference (approved by UK government, but still pending State Aid Clearance by the European Commission): £264.55 million per year [subsidy element calculated as strike price minus wholesale price];
- 2 Unit conversions to be funded via ROCs: £185.04 each i.e. £370.08 million per year

In addition, Drax has been granted Capacity Market Payments for two coal units, amounting to £25.6 million per year.

Total: 2 units on biomass getting ROCs plus 1 unit on biomass getting Contract for Difference plus two coal units getting Capacity Market Payments: **£660.23 million per year**.

[2] According to Secretary of State Vince Cable, without converting to biomass and the loan from the Green Investment Bank that has helped to finance it, Drax "would have closed down because it has to meet European rules on coal use and it wouldn't have been able to survive"

http://www.ft.com/cms/s/d46bfe86-b7e9-11e2-bd62-00144feabdc0.Authorised=false.html?_i_location=http%3A%2F%2Fwww.ft.com%2Fcms%2Fs%2F0%2Fd46bfe86-b7e9-11e2-bd62-00144feabdc0.html&_i_referer=http%3A%2F%2Ftech.groups.yahoo.com%2Fgroup%2Fbiofuelwatch%2Fmessage%2F5679#axzz2T9zy94Nu.

In addition, Drax state "Our FGD plant already complies with known future SO₂ emissions limits to 2016.", but do not confirm compliance beyond 2016.

<http://www.drax.com/sustainability/environment/environmental-performance/>

[3] Drax annual pellet requirements: This figure is an estimate based on the following calculations by Biofuelwatch.

Assumptions:

Net Calorific value by mass of 1 kg of wood pellets = 4.8 kWh/kg

(http://www.biomassenergycentre.org.uk/portal/page?_pageid=75,20041&_dad=portal&_schema=PORTAL)

Efficiency of 1 Drax unit = 40%

Capacity of 1 Drax Unit = 630 MWW

Hours of operation per year = 7000

Calculation:

Mass of pellets required to produce 1 MWh thermal = $1000/4.8 = 208.3$ kg pellets

Mass required to produce 1 MWh electricity = $208.3/\text{Efficiency} = 520.75$ kg pellets

Mass of pellets required to produce 1 MWh x Capacity of unit x hours of operation = Mass of pellets burned in 1 year

$520.75 \times 630 \times 7000 = 2296507500$ kg pellets = 2296508 tonnes of pellets = 2.3 million tonnes of pellets

2.3 million tonnes x 3 units = **6.9 million tonnes of pellets per year**

This figure could be an underestimate, as conservative figures for efficiency, generating capacity and hours of operation have been used.

[4] Evidence of forest destruction and use of whole trees in the southern US by Drax pellet suppliers: <http://www.dogwoodalliance.org/2012/11/new-report-discredits-uk-energy-company-claims-that-pellets-come-from-wood-waste/>

<http://www.dogwoodalliance.org/2013/08/press-release-new-maps-reveal-envivas-ahoskie-wood-pellet-facility-threatens-southern-wetland-forests-surrounding-ecosystems-and-wildlife/>

[5] Further evidence of this is included in details of Drax supplier Enviva's recent disclosures as part of its Initial Public Offering:

Drax is Enviva's largest customer, and Enviva supplies nearly half of Drax's wood biomass imported

from the U.S.. This is among several disclosures in Enviva's initial public offering ("IPO") filed with the US Securities and Exchange Commission on October 27, 2014. [United States Securities and Exchange Commission, Form S-1 Registration Statement, Enviva Partners, LP (October 27, 2014) ("Enviva IPO"). The Enviva Partners, LP filing with the US Securities and Exchange Commission can be accessed at

<http://www.sec.gov/Archives/edgar/data/1592057/000119312514383777/d808391ds1.htm>

Enviva produces 1,740,000 metric tons of wood pellets per year. [*Id.* at 127.] Enviva has off-take contracts with Drax to supply 1,000,000 MTPY of wood pellets through 2018. [*Id.* at 132.] In its IPO, Enviva states "the wood fiber used for wood pellet production comprises predominantly "pulpwood" and "wood residues" and "represents approximately 3% of the annual removals in the Southeastern U.S." and "less than 0.1% (approximately 214,000 acres or 97,203 hectares [U.S. Forest Service, The Southern Forest Futures Project: Technical Report , General Technical Report SRS-178 p. 106.]) of the total Southeastern U.S. forest inventory." [Enviva IPO at 139.] Enviva admits harvesting softwood and hardwood whole trees for wood biomass, with procurement ranging from "direct purchase of timber tracts" for harvest to the acceptance of "gatewood" delivered to its pellet mills:

"Our wood fiber is procured under a range of arrangements, including (1) the direct purchase of *timber tracts* which provide an inventory of *stumpage* for up to 36 months, (2) *logging* contracts for the thinnings, pulpwood and other unmerchandized chip-and-saw *timber* cut by a harvester, (3) in-woods chipping contracts where we may also provide the actual harvesting assets, (4) contracts with *timber* dealers, and (5) "*gatewood*" purchases, which refer to wood hauled to a mill that was not purchased as *standing timber* by the mill. During the year ended December 31, 2013, we sourced our wood fiber from approximately 289 suppliers, including landowners growing both *hardwoods* and *softwoods*." [*Id.* at 140 (emphasis added)]

[6] <http://www.drax.com/biomass/biomass-data/>

[7] For example, documented evidence by environmental organisations in the southeastern US can be used to show that certain sourcing by Enviva, a major Drax pellet supplier, is comparable to BEAC Scenario 13(a) resulting in a carbon intensity of 3346 kg CO₂/MWh, and BEAC Scenario 13(b) resulting in a carbon intensity of 2717 kg CO₂/MWh. An average of these two scenarios results in a carbon intensity 3 times the 1018 kg CO₂/MWh attributed to burning coal.

See also <https://www.foe.co.uk/sites/default/files/downloads/decc-s-biomass-carbon-calculator-beac-what-it-means-bioenergy-74112.pdf>

[8] Drax's Biomass Supply Report states that greenhouse gas is "calculated using Ofgem Solid and Gaseous Biomass Carbon Calculator (B2C2)" See: <http://www.drax.com/media/56583/biomass-supply-report-2014.pdf>, Page 5.

According to Ofgem, "The UK Biomass & Biogas Carbon Calculator incorporates the calculation methodology set out in the Renewable Energy Directive [Directive 2009/28/EC of the European Parliament and Council on the use of energy from renewable sources and subsequently repealing Directives 2001/77/EC and 2003/30/EC], taking account of the recommendations set out by the European Commission in their report on sustainability requirements for solid and gaseous biomass [Report from the Commission to the Council and the European Parliament on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling, SEC(2010) 65 and SEC(2010) 66]." See: <https://www.ofgem.gov.uk/publications-and-updates/uk-solid-and-gaseous-biomass-carbon-calculator>.

According to the BEAC report, there are significant flaws in the Renewable Energy Directive methodology: "However, the Renewable Energy Directive LCA methodology does not account for changes in the carbon stock of a forest, foregone carbon sequestration of land, or indirect impacts on carbon stocks in other areas of land". See:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/349024/BEAC_Report_290814.pdf, Page 5 and a more detailed explanation on Page 41.

[9] <http://www.tanac.com.br/en/news/tanac-sa-announces-plans-construct-us60-million-wood-pellet-mill-brazil>

Tanac SA say that the bulk of the pellet mill investment is for its supply chain, which confirms that there will have to be plantation expansion: <http://www.tanac.com.br/en/news/tanac-invests-us-60-million-wood-pellet-mill-rio-grande-do-sul-state-brazil>

[10] See <http://www.ejolt.org/2012/06/an-overview-of-industrial-tree-plantations-in-the-global-south-conflicts-trends-and-resistance-struggles/> and <http://biofuelwatch.org.uk/wp-content/uploads/eucalyptus-plantations-for-energy-online.pdf>

[11] For a list of studies into the carbon impacts of biomass electricity, see www.biofuelwatch.org.uk/resources-on-biomass. In addition, the report "Dirtier than coal?" published by RSPB, Friends of the Earth and Greenpeace can be found here www.rspb.org.uk/Images/biomass_report_tcm9-326672.pdf.

The scientific community is increasingly appealing to policy makers to correct carbon accounting mistakes, for example http://docs.nrdc.org/energy/files/ene_13090603a.pdf

[12] See reference [2] above

[13] This figure is an estimate based on the following calculation by Biofuelwatch.

Assumptions:

Net Calorific value by mass of 1 kg of thermal coal = 9.2 kWh/kg

(http://www.biomassenergycentre.org.uk/portal/page?_pageid=75,20041&_dad=portal&_schema=PORTAL)

Efficiency of 1 Drax unit = 40%

Capacity of 1 Drax Unit = 660 MWW

Hours of operation per year = 7000

Calculation:

Mass of coal required to produce 1 MWh thermal = $1000/4.8 = 108.7$ kg coal

Mass required to produce 1 MWh electricity = $208.3/\text{Efficiency} = 271.75$ kg coal

Mass of coal required to produce 1 MWh x Capacity of unit x hours of operation = Mass of coal burned in 1 year

$271.75 \times 660 \times 7000 = 1255485000$ kg coal = 1255485 tonnes of coal = 1.3 million tonnes of coal

1.3 million tonnes x 3 units = **3.9 million tonnes of coal per year**

[14] E.g. <http://www.bbc.co.uk/news/science-environment-31456161>

[15] Drax confirmed in March 2015 that about 18% of their coal is sourced from Colombia, including from the Cerrejon mine (pers comm)

[16] Human rights abuses in Colombia because of conflict between communities and coal mining companies have been extensively documented by many organisations over many years, for example:

<http://www.globaljustice.org.uk/resources/cerrej%C3%B3n-mine>

<http://londonminingnetwork.org/2014/06/cerrejon-coal-colombia-an-abusive-marriage-full-of-machismo/>