

New UK Biomass Policy Removes Subsidies For High-Carbon Wood Pellets

September 3, 2018

Attention bioenergy and wood pellet investors: the UK has just announced a [new policy](#)¹ that could limit future wood pellet markets, particularly if adopted by other countries. The policy sets a new and substantially lower limit on fossil-fuel “lifecycle” CO₂ emissions from biomass fuels in order to qualify for renewable energy subsidies, **a limit that appears to be impossible for wood pellets to meet.** Given the extreme dependence of the biomass power industry on subsidies, and its growing dependence on imported wood pellets, this is a significant development.

Counting wood-burning power plants as having zero emissions, when in fact they emit more CO₂ per megawatt-hour than coal plants, is the central scandal of the EU and UK approach to carbon accounting for biomass. However, the UK *does* limit fossil-fuel emissions from harvesting, processing, and transport of biomass (“lifecycle” emissions, for short, though true lifecycle emissions include the CO₂ from actually burning the fuel.)

To qualify for subsidies, biomass power plants have to meet a decreasing schedule of fossil fuel lifecycle emissions associated with the fuels they burn.² Published September 1, 2018, the new standard (29 kg CO₂/MWh), which applies to plants commissioning after April 1, 2021 through March 31, 2026, is just 14.5% of the previous 2020 standard for existing plants (200 kg CO₂/MWh) (Table 1).

Fossil fuel emissions from biomass manufacturing and transport: allowable levels to qualify for subsidies

What power stations affected	When policy is in effect	Standard (g CO ₂ /MJ)	Standard (kg CO ₂ /MWh)
Most stations	to 2020	79.2	285
Stations built after 2013	to 2020	66.7	240
All stations - old std	2020- 2025	55.6	200
All stations - old std	2025-2030	50.0	180
New std for stations built FY 2021 - 2026	15 yrs from comissioning	8.1	29

Table 1. Schedule of allowable fossil fuel emissions for electricity generated at dedicated biomass-burning power plants. The standard for new plants is significantly lower than the

previous standard.

To develop the new standard, the UK government conducted a public consultation. PFPI and allies weighed in, with the UK-based [Biofuelwatch](#) doing particular heroic duty by marshalling a letter-writing campaign by the public.

It does not appear that wood pellets can meet the new standard of 29 kg CO₂/MWh. Figure 1 shows all the monthly weighted averages for solid³ biomass fuels reported to the UK’s “Ofgem” agency, which makes the data public in a limited way (more on that later). The graph breaks out monthly fossil fuel emissions averages for wood pellets versus other types of solid fuels (which is largely other types of wood),⁴ and shows the new standard as a dotted line for comparison. Every monthly weighted average for wood pellets is significantly above the new standard; there are *no* wood pellets that meet the standard.

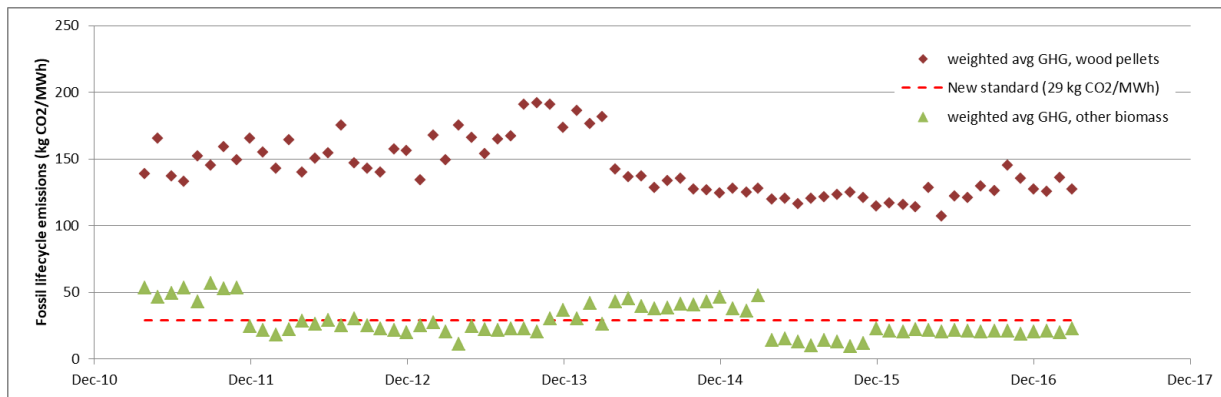


Figure 1. Weighted averages for fossil fuel CO₂ emitted by harvesting, manufacturing, and transporting wood pellets and other solid biomass fuels burned in the UK for electricity generation.

Again, remember, the standard just counts GHG emissions from fossil fuels burned during harvest, manufacturing, and transport of biomass fuels – *not* the CO₂ coming out the smokestack, which is dramatically higher. As a demonstration, Table 2 shows data from the [annual report](#) of UK-based Drax,⁵ the largest biomass plant in the world, which burns wood pellets in four of its six boilers. The calculations (added by PFPI) show that the emissions rate for wood pellets is higher than for coal, and at 902 kg CO₂/MWh, much higher than both the old and new “lifecycle” emissions standards that only count fossil fuel CO₂. For comparison, over the last five fiscal years of reporting – from April 2012 to March 2017 – Drax’s weighted average for fossil lifecycle emissions was 128 kg/MWh, about 14% of the 902 kg “biogenic” CO₂/MWh Drax reports as coming from the smokestack. That fossil fuel emissions rate is strongly influenced by Drax’s use of imported wood pellets as fuel; while Drax reports burning other wood, as well as straw, sunflower, willow coppice, and miscanthus, of the 19,958,391 tonnes of biomass Drax reported to the government over the five years, 19,267,696 tonnes (97%) was wood pellets, mostly imported from the US and Canada.

TABLE 1 FOSSIL FUEL, OPERATIONS AND PURCHASED ELECTRICITY EMISSIONS						
Activity	Unit of measure	2016 kt	2015 kt	2014 kt	2013 kt	2012 kt
Scope 1						
Fossil fuel combustion	KT	6,021	13,101	16,476	20,162	22,513
Operations	KT	<100	<100	119	157	180
Total Scope 1	KT	6,021	13,101	16,595	20,319	22,693
Scope 2						
Purchased electricity	KT	151	216	249	293	341
Total Scope 1 and 2	KT	6,172	13,317	16,844	20,612	23,034





TABLE 2 BIOLOGICALLY SEQUESTERED CARBON (BIOMASS COMBUSTION) EMISSIONS						
Activity	Unit of measure	2016 kt	2015 kt	2014 kt	2013 kt	2012 kt
Biologically-sequestered carbon (biomass combustion)	KT	11,455	10,238	7,150	2,799	1,214



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Coal: $6,021 \text{ kt CO}_2 \div 6.9 \text{ TWh} = \mathbf{872.61 \text{ kt CO}_2 / \text{TWh}}$

Biomass: $11,455 \text{ kt CO}_2 \div 12.7 \text{ TWh} = \mathbf{901.97 \text{ kt CO}_2 / \text{TWh}}$
(equivalent to kg/MWh)

Table 2. Stack emissions from burning coal and wood pellets at Drax. The emissions rate for biomass is much higher than any of the standards for fossil fuel lifecycle emissions shown in Table 1.

With the new standard of 29 kg CO₂/MWh for fossil lifecycle emissions, the UK government is admitting that imported pellets undermine the UK’s efforts to reduce emissions – even when the biogenic “stack” CO₂ is excluded.

Unfortunately, because it only applies to new plants commissioning in 2021 – 2026, the policy excludes Drax, the chief offender, and two grandfathered plants already in the pipeline that will burn a combined total of around 3 million tonnes of imported pellets per year. Nevertheless, the document contains surprising little digs at Drax and the other plants, stating that the new criterion of 29 kg/MWh “*supports solid and gaseous biomass plants that have low GHG emissions compared with currently operating plants*” and, “*The government recognises the concerns raised that the new GHG threshold value is a significant decrease compared to the existing one, and this proposed change could make it more challenging to deliver projects using some of the largest scale biomass generation options. However, revising the GHG threshold would be consistent with the aim of the CfD scheme to support low carbon electricity.*”

More:

“*Continuing to apply the existing GHG threshold would lead to GHG emissions significantly above the projected UK grid average for most of the lifetime of any new CfD projects (as UK grid carbon intensity has declined and projected to continue to decrease with time). As a result, biomass plants offered 15-year contracts from the early 2020s need to be subject to tightening emissions controls in order to meet the CfD scheme’s objectives of supporting low carbon*

electricity.”

We believe the government should apply the new standard to Drax and the two grandfathered plants as well. As the government has itself admitted, burning biomass with a high fossil fuel “signature” is not compatible with reducing emissions from the grid. The climate is what matters here.

If Drax were to be denied subsidies under this new standard, it would have a significant impact. The standard restricts subsidies under the UK’s “Contracts for Difference” (CfD) program, where the government agrees to pay the biomass plant operator the difference between the ‘strike price’ – an elevated price for electricity that includes the cost of building and running a biomass plant – and the ‘reference price’ – a measure of the average market price for electricity. CfD’s are quite lucrative, as demonstrated by Drax’s statement in its 2016 annual report, after getting just one of its four biomass units qualified for CfD’s: *“The Group began generating under the CfD contract on 21 December 2016 and, in accordance with this policy, accrued £10.3 million of revenue in respect of amounts due from the LCCC in the period ending 31 December 2016.”*⁶ Not a bad (10) days’ work – that’s over a million pounds (about \$1.33 million) per day to burn wood pellets that clearcut North American forests and increase atmospheric CO₂.⁷

It’s about time the UK clamped down on its subsidies for biomass, if only because the loopholes in program oversight are scandalous. Again, the central problem with the UK carbon accounting is that it doesn’t count the single largest source of emissions – the CO₂ coming out the smokestack when biomass is burned. But the UK’s system is broken for even the CO₂ it *does* count.

1. Companies report the fossil fuel emissions data themselves, and Ofgem doesn’t check it. Ofgem’s datasheets⁸ even state, *“NB - This information has not been verified by Ofgem and is provided by the operator to the best of their knowledge and belief.”* These are the very data that determine the fate of millions of pounds in subsidies per day. (Drax also gets other subsidies in addition to the Contracts for Difference; the company currently gets around £2 million per day).
2. Ofgem makes it impossible to match data on GHG signature and country of origin. Companies are required to estimate the fossil fuel signature for every shipment of wood pellets they receive. Ofgem makes these data public, but splits up the data so that the GHG emissions data is on one sheet, by shipment, and the country of origin data is on another sheet, but aggregated. Ofgem thus ensures the public has no way to analyze the data. Do pellets from British Columbia-based Pinnacle Pellets, which are shipped to the UK through the Panama Canal, entail more fossil fuel emissions than those shipped from the US-based Enviva? We’re not allowed to find out, because even in response to freedom of information requests, Ofgem claims this is “confidential” commercial information.
3. Ofgem doesn’t seem all that interested that different companies report quite different values for pellets shipped from the same country. Drax and the now-defunct Ironbridge station were both sourcing pellets from a variety of companies, including in the US and Canada.

Ironbridge reports 715,623.92 tonnes of pellets in FY 2015-2016. Despite Ofgem’s obfuscation of the data, as described in point 2 above, we were able to identify four individual shipments in the Ironbridge data that year where we could match the GHG signature with the country of origin.

Tonnes	Fossil CO2 emissions (kg CO2/MWh)	Country of origin
24,808.97	188.1	Canada
8,137.87	187.0	Canada
3,784.30	85.4	Spain
950.78	196.0	USA

Table 3. Fossil GHG emissions from four shipments of pellets reported by the Ironbridge biomass power station in 2015-2016.

These data suggest that pellets imported from Canada and the US are likely to have a high fossil GHG signature. Yet Drax, which also imports mainly from the US and Canada, somehow reports that 100% of the 6,421,977.91 tonnes of pellets it imported that year had GHG signatures **at or below 150 kg CO₂/MWh** – significantly lower than what Ironbridge was reporting. Figure 2 shows the weighted averages for just wood pellets imported by Drax, versus those grouped as “other,” the companies Ironbridge and Tilbury, another biomass project, with a 6-month moving average. It would be interesting to understand why the values differ so much. Of course, with self-reporting by companies and no checking or data transparency by Ofgem, there’s no way to find out why.

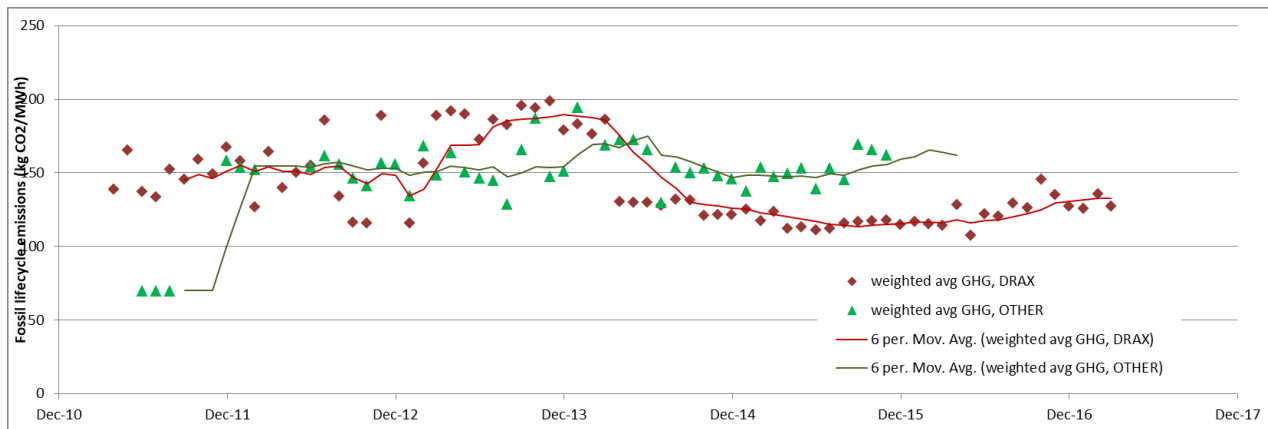


Figure 2. Weighted average fossil lifecycle emissions data for wood pellets imported by the Ironbridge and Tilbury stations, versus Drax.

- The data are sometimes incomplete. For instance, the sum of wood pellets imported in 2015-2016 by Ironbridge matches on the GHG data and country-of-origin datasheets in the workbook,⁹ but is missing from a third sheet; the Drax totals don’t match, but the data are found on the third sheet. Why is this? Did anyone at Ofgem notice?

Maybe the UK government *has* finally noticed. Maybe they have gotten the message - that wood pellets are a giant expensive unverifiable hassle that are, more than likely, increasing emissions.

The government may have even gotten the message that it's time to start counting the CO₂ when the biomass is burned. The new policy consultation states, p. 37 (emphasis added)

“Many respondents argued against the appropriateness of the RED LCA methodology and provided evidence of its limitations. For example, the methodology assumes GHG emissions at the smoke stack from biomass to be zero. Furthermore, it accounts for direct GHG emissions from direct land use change (where it has changed category since 2008), from the cultivation, harvesting, processing, and transportation of biomass, but not complex and uncertain indirect GHG emissions. The latter includes changes in the carbon stock of a forest, possible impacts on other biomass using industries, and foregone carbon sequestration of land.”

Policy response: The government is aware of stakeholder views regarding potential limitations in the scope of the current LCA methodology. As stated in the December 2017 consultation, the UK position on the methodology may be re-examined once the position of RED 2 has been confirmed.”

We are not holding our breath, but, given that the UK Climate Change Committee is due to publish an important report on bioenergy in October, it's hard to imagine that the controversy about wood pellet impacts on forests and the climate won't be discussed at length.

One more encouraging development:

An [earlier decision](#) from the UK government,¹⁰ published in June, states that “Dedicated biomass and energy from waste schemes are only eligible for CfD support if they are deployed with combined heat and power (CHP),” and that the subsidies should only go to “good quality” CHP. Accordingly, “The government intends to require all dedicated biomass with CHP and energy from waste with CHP schemes applying for new CfD contracts to have a minimum: • 70% overall efficiency (net calorific value).”

This was also welcome, as it makes huge projects like Drax, which blow off two-thirds to three-quarters of the energy in the wood they burn as waste heat to the atmosphere, ineligible for subsidies. Only relatively small projects can find “heat customers” capable of utilizing enough waste heat that the project can meet a 70% efficiency threshold.

The UK government may think they are trapped into continuing to provide subsidies to Drax and other grandfathered plants that are in the pipeline. We'd like to see them shake free.

Nonetheless, these new policies represent a huge step forward – an admission that the government got its biomass policy wrong to begin with, and an attempt to reverse incentives that have led to severe and widespread forest clearcutting in North America. **Other countries should take note, follow the UK's lead, and end subsidies for wood pellets now.** If lifecycle emissions from shipping pellets from the US to the UK are high, what about shipping to Japan and Korea? Yet those are the new markets that Enviva and other large pellet companies are seeking to exploit.

Message to the world: Don't make the costly mistakes the UK made. There's still time to turn away from expensive, polluting bioenergy and re-allocate subsidies to zero-emissions electricity generation.

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/736640/Consultation_document.pdf

² https://www.ofgem.gov.uk/system/files/docs/2018/04/ro_sustainability_criteria.pdf

³ The graphic does not include liquid or gaseous biomass fuels, which are burned in different types of power stations.

⁴ fuels that are clearly wood but are not pelletized constitute about 26% of the 40.5 million tonnes biomass reported by Ofgem since 2011, non-wood fuels constitute about 11%, and pellets constitute 62%

⁵ <https://www.drax.com/wp-content/uploads/2017/03/Drax-Group-plc-annual-report-and-accounts-2016-Smart-Energy-Solutions.pdf>

⁶ Page 127 at <https://www.drax.com/wp-content/uploads/2017/03/Drax-Group-plc-annual-report-and-accounts-2016-Smart-Energy-Solutions.pdf>

⁷ <http://www.pfpi.net/how-uk-bioenergy-hurts-forests-and-the-climate>

⁸ <https://www.ofgem.gov.uk/environmental-programmes/ro/applicants/biomass-sustainability>

⁹ <https://www.ofgem.gov.uk/environmental-programmes/ro/applicants/biomass-sustainability>

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