

Subsidies for biomass electricity must be stopped and diverted to low-carbon renewables and energy saving measures

In 2015, energy companies received £817 million in UK subsidies for burning solid biomass for electricity, the vast majority of it wood¹. This figure is expected to increase substantially in future, given increases in capacity and a higher subsidy rate for new biomass schemes guaranteed by already awarded Contracts for Difference.

In 2014/15 power stations burned pellets and woodchips made from almost 15 million tonnes of green wood for electricity.² No biomass capacity has been added since then. In contrast, the UK's total wood production in 2015 was just 10.8 million tonnes. The UK is now the world's number one importer of wood pellets, most of them from North America.

Far from helping to reduce carbon emissions and make the UK's energy system more sustainable, biomass electricity results in high upfront and long-term carbon emissions, whilst harming forests and biodiversity.

Climate impacts of biomass electricity

Burning biomass for electricity always results in greater upfront emissions of CO₂ than burning coal (per unit of energy). This is due to the lower efficiency of generating electricity from biomass rather than from coal. This has been acknowledged by the International Panel on Climate Change³. However, current UK policy ignores the upfront CO₂ emissions from biomass. It assumes that future tree growth will sequester the emitted CO₂. However, a growing volume of scientific studies shows this assumption to be flawed,⁴ due to

- the time lag between upfront CO₂ emissions from power stations on the one hand and CO₂ sequestration by future tree growth on the other hand;
- "Leakage", whereby burning residues and waste wood for fuel results in industries which would have otherwise used those feedstocks resorting to more extensive or intensive logging;

- long-term reductions in soil and vegetation carbon stocks from more extensive or intensive logging and conversion of natural forests to monoculture plantations.

The climate impacts of biomass electricity are even worse when the substantial methane emissions from woodchip storage are taken into account. Although the climate impacts of biomass sourced through additional logging are the worst, scientific evidence shows that burning forest residues for electricity nonetheless results in significantly adverse climate impacts over a period of several decades.⁵

Impacts on forests and biodiversity

The Convention on Biological Diversity and its Aichi Target require all member states (including the UK) to reduce or phase out subsidies that are harmful to biodiversity. There is strong evidence that UK subsidies for biomass electricity cause significant harm to biodiversity.

The production of wood pellets for use in the UK – specifically for use in Drax power station – is causing significant harm to forest ecosystems and biodiversity in the southern US. According to Drax Plc's Annual Report for 2015, Drax burned over 3.1 million

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tonnes of pellets from the US that year. Each tonne of pellets requires around two tonnes of green wood, which means that Drax burned the equivalent of approximately 6.2 million tonnes of wood from the US. All of this came from pellet mills in the southern US, the majority owned by Enviva.

Investigations by US conservation NGOs have shown logs from clearcut wetland forests in North Carolina being processed at an Enviva pellet mill known to supply Drax⁶. Both NGO and peer-reviewed scientific studies show that the growing production of pellets in the region – most of it currently for export to the UK – poses a serious threat to biodiverse natural forest ecosystems in the region, due to increased clearcutting and conversion of natural forests to monoculture tree plantations.⁴

Sawmill residues and waste wood are often cited as potential bioenergy sources with no negative biodiversity impacts. However, figures contained in a US Department of Agriculture Report from 2012⁷ show that 59.3 million dry tonnes of wood residues were produced at timber-processing facilities in the US, but more than 99% of those were used for other purposes and thus not available for pellet production. Clearly the availability of processing residues and waste wood for bioenergy is too small to support large-scale biomass electricity.

UK biomass and greenhouse gas standards do not protect climate or forests:

Standards introduced by the UK ignore all upfront and most lifecycle carbon emissions from biomass burning. They are not subject to any independent auditing or verification. Two Drax pellet mills have obtained eligible certificates on the basis of consultants visiting two overlapping areas of around 4 million hectares each for a total of just 7 hours.

Alternatives to Biomass Electricity:

A recent report commissioned by the

Natural Resources Defense Council⁸ indicates that, even without science-based accounting for life-cycle CO₂ emissions, the cost of onshore wind and solar power will be similar to or lower than that of coal-to-biomass conversions in 2020, and significantly lower in 2025. The study did not look at dedicated biomass power stations, but the subsidy rate for those is higher because they are even more expensive than coal-to-biomass conversions. Furthermore, while the capital cost of solar and wind power continues on a downward trend, there is no realistic prospect of biomass electricity costs coming down because combustion technologies are already mature, and because high dependence on imports make this sector vulnerable to changes in currency rates.

Stopping biomass subsidies and diverting funding towards sensibly sited wind and solar projects, as well as energy conservation and efficiency would help to reduce carbon emissions from the energy sector. Support for new onshore wind and solar PV capacity and for home energy conservation are vital and viable alternatives to both coal and biomass electricity.

References:

- 1 This figure is based on Ofgem data available via ref.org.uk/generators/group/index.php?group=TechGroup and the average market price per ROC in 2015, which was £42.69
- 2 For full references and details regarding the amount of biomass burned for electricity in the UK, see <https://www.ofgem.gov.uk/publications-and-updates/biomass-sustainability-dataset-2014-15>
- 3 ipcc-ngqip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf
- 4 For a list of relevant studies, see biofuelwatch.org.uk/biomass-resources/resources-on-biomass/
- 5 sciencedirect.com/science/article/pii/S0378112715001814 and sciencedirect.com/science/article/pii/S0961953411005502
- 6 biofuelwatch.org.uk/wp-content/uploads/Enviva-Investigation.pdf
- 7 srs.fs.usda.gov/pubs/gtr/gtr_wo091.pdf
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