

Biomass electricity: what is it and what's wrong with it?



- The vast majority of biomass burned for power and heat in the UK comes from wood, most of it from whole trees that are cut down.
- Since 2015, the UK has burned more imported wood every year than it can produce, to create less than 1% of the country's final energy demand.
- Cutting down trees and burning them makes climate change worse.
- The UK's biomass demands are damaging forests and communities in other countries.
- In 2018, power companies received over £1 billion in “renewable energy” subsidies for biomass. These subsidies are paid out of a surcharge on your electricity bill and should be spent on genuinely low-carbon renewable energy like wind or solar power.

Climate change

Per unit of energy generated, biomass emits more CO₂ than coal. The Government allows power companies to ignore all those emissions. However, as 800 scientists said in an Open Letter to the EU government in 2018:

“Even if forests are allowed to regrow, using wood deliberately harvested for burning will increase carbon in the atmosphere and warming for decades to centuries... even when wood replaces coal, oil or natural gas. The reasons are fundamental and occur regardless of whether forest management is ‘sustainable’.”

This is because it takes decades for new trees to grow, and often even longer for soils to absorb all

the carbon lost during logging – if forests are able to regrow at all.

To have any chance of staying within 1.5° global warming, we need to reduce CO₂ levels and emissions rapidly. This means that as well as quitting fossil fuels, we must protect and restore forest ecosystems and other biodiverse habitats. The only proven way to remove carbon from the atmosphere is to allow natural ecosystems, including soils, to grow and regenerate. Replacing fossil fuels with an energy system that relies on cutting down trees is a false solution.

If forests are replaced with tree plantations, CO₂ will be lost to the atmosphere forever because tree plantations contain much less carbon than forest ecosystems, as well as supporting fewer species.

Other parts of the bioenergy supply chain also emit carbon; for example, storing woodchips emits significant amounts of methane, and those methane emissions are not accounted for by anybody.

Lots of land and wood for hardly any power

In 2018, Drax Power Station burned pellets made from 14.4 million tonnes of wood, which is the equivalent of 120% of the UK's total wood production that year. Burning far more than the UK's total annual wood production supplied a mere 0.74% of the total energy the UK used in 2017! Biomass electricity is the least efficient way of using land to produce (renewable) energy – by a long stretch!

'Waste and residues?'

Many biomass plants claim to burn only 'waste and residues' from 'sustainably managed forests'. However, the amount of genuine residues available is tiny compared to the demand for wood. Timothy Searchinger has calculated that burning 100% of the UK's forestry residues could only generate 0.9% of the country's electricity supply.

There is no universally accepted definition of 'residues'. NGOs such as the Dogwood Alliance in the southern US have extensively documented whole trees being taken from forests to pellet plants. Pellet supplier Enviva routinely calls trees 'low-value' and 'residues' just because they have not grown thick, straight and tall! This applies to the majority of trees in many forest ecosystems!

Even burning genuine forest residues can increase carbon in

Sustainability standards?

Existing biomass sustainability standards are weak and hard to enforce. More importantly, no sustainability standards can overcome the fundamental problem with biomass: the amount of wood required for energy is too high. It is simply not possible to replace a significant portion of fossil fuel burning with biomass burning without causing huge damage to forests, to the communities that depend on them, and to the climate. The most effective way to limit damage from the biomass supply chain would be for governments to stop subsidising biomass as "renewable energy".

the atmosphere for a long time. Moreover, removing all logging residues depletes soils of both carbon and the nutrients needed by future trees. Ecosystems need 'residues', including dead trees and branches, to survive and regenerate!

Some UK biomass plants – such as RWE's in Markinch and E.On's near Sheffield – burn mainly waste wood, i.e. wood that has previously been used for construction or furniture. However, this causes even more air pollution than burning virgin wood. Moreover, so much waste wood is now being burned for energy that it competes with better uses, such as wood panel products. We have heard anecdotally that companies that would otherwise use waste wood to make durable products now import virgin wood from as far as Brazil. This is no better than burning Brazilian wood in power stations in the first place!

Plantations or forests?

The biomass industry is responsible for the destruction of forests and their conversion to plantations – a fact confirmed by the world's largest pellet company Enviva's own recent data. While Enviva claims that the amount of forested land in its sourcing area has increased, the Dogwood Alliance states that:

"what these numbers are really showing is a growth in pine plantations. According to the US Forest service's own data, since 1953, we've lost more than 37 million acres of natural forests, while pine plantation acreage has grown by about 42 million acres."

What can I do?

- Sign up to receive Biofuelwatch news and action alerts;
- Write to your MP asking them to support the call to scrap subsidies for burning wood;
- Contact us to organise a public meeting or biomass film screening in your area.



A red wolf. Photo Christine Majul.

Tree plantations pose a major threat to biodiverse ecosystems. In the southern US (where most pellets imported by the UK come from), plantations have been expanding at the expense of biodiverse forests for decades. The forests they replace provide habitat for many species and are vital for water filtration, flood prevention, soil protection, nutrient cycles and carbon sequestration. Living and dead trees play a critical role. Plantations, on the other hand, support few if any other species.

Establishing tree plantations often means using synthetic fertiliser and pesticides. It means damaging and compacting soil with heavy machinery, and preventing 'weeds', or anything that might compete, from growing. Non-native trees grown in monocultures commonly spread beyond plantations and can cause devastating wildfires, as happened with eucalyptus plantations in Portugal.

Especially in the global South, industrial tree plantations have caused large-scale land grabbing, depriving communities of their land, livelihoods and food sovereignty.

Logs being taken into an Enviva pellet plant. Photo by Dogwood Alliance.

