

BIOENERGY IS PUTTING BRITAIN'S ENERGY SECURITY AT RISK

CUT CARBON
NOT FORESTS



In 2022, UK [gas prices](#), and in turn energy bills, rocketed. The Prime Minister has made energy security one of his priorities, and the Government has put security at the heart of its [plans for the energy system](#). A Government Department has even been renamed to prioritise energy security alongside net zero.

But the Government's prioritisation of energy security is not resulting in a shift to the home-grown, low-carbon, and cheap energy technologies that would truly protect UK energy supply. Instead, the Government is turning to costly, volatile, and imported fuels, including large amounts of bioenergy – the burning of wood (or crops) to generate electricity (or heat or transport fuels).

Indeed, the UK Government's [Biomass Strategy](#) puts bioenergy at the heart of its energy plans. This plan has significant implications for the UK's energy and food security. The fuel bioenergy relies on – imported wood – is likely to climb in price [as demand increases](#), possibly preventing the UK from obtaining what it needs. Further, if the UK pivots from importing wood to growing and burning domestic energy crops, it will eliminate land that is currently being used for food

production or is needed for nature restoration.

New analysis shows that the volume of energy crops the Government would need to import every year by 2050 to fulfil the requirements of its strategy would require up to 2.4 million hectares of land overseas to grow them. This is equivalent to [all the arable land that Denmark has](#). As well as throwing up important questions for climate justice this reveals why security of supply is such an issue. If global demand for wood pellets increases as other countries seek to develop BECCS in pursuit of their own climate goals, there is a real risk that food production will be squeezed. The UK Government does not appear to have seriously engaged with realities of finite resources and global market dynamics.

As explained further below, even the UK Government itself admits in the Biomass Strategy that it may only have access to just over half of the biomass its energy plan requires. This is the opposite of the energy security the country so desperately needs, especially after the sky-high energy costs experienced in recent years.





CONTINUING TO IMPORT WOOD PELLETS MAY BECOME FINANCIALLY IMPOSSIBLE FOR THE UK

The UK now imports [around 9 million tonnes of wood pellets per year](#) – largely from the U.S. and Canada – to burn for bioenergy, mainly at Drax power station. The cost of this fuel is the single biggest operating cost for bioenergy power plants and, according to the bioenergy industry, rising fuel costs are its [biggest concern for the future](#).

Global demand for wood is predicted to [quadruple by 2050](#), which will lead to increased competition. At the same time, [increased impacts from climate change](#) will likely harm trees and forests, reducing supply. These events, together, would likely lead prices for wood products like pellets to explode.

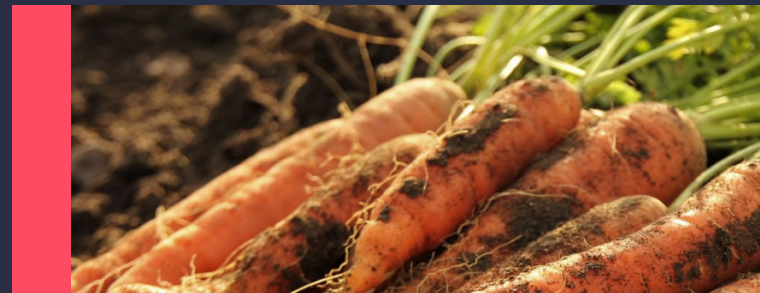
GROWING BIOMASS IN THE UK WOULD UNDERMINE BRITAIN'S FOOD SECURITY

The [Climate Change Committee proposes](#) that instead of relying so heavily on wood pellets, the UK could meet future bioenergy demand in part by growing energy crops in the UK. This would only displace some need for biomass imports, but would still require approximately 7% of all the agricultural land in the UK – putting the country's food supply at risk. Growing these crops in natural areas as opposed to existing agricultural land wouldn't work either, as this land is desperately needed to fulfil the [Government's commitment](#) to protect and restore 30% of land for nature.

In part because bioenergy requires a huge amount of land, the UK should increase its focus on space-saving renewable energies like [solar panels](#), which currently cover only 0.08% of the UK's land, and onshore wind. Even [tripling onshore wind](#) from current levels would only cover 0.02% of UK land, while generating enough electricity for 29 million homes.

Policy changes intended to price wood pellets in a way that properly accounts for their true carbon impact could also increase pellet prices. Indeed, the UK's Climate Change Committee stated that if the true carbon impact of wood pellets were factored into their cost, their price [could rise anywhere from 100% to 500%](#).

Existing wood pellet demand is estimated to require the cutting down of trees from around 45,000 hectares of land. Despite its commitment to plant 30,000 hectares of trees every year, the UK is only planting around 13,000, meaning that for every hectare of trees created in the UK, around 3 hectares are logged for bioenergy.





THE UK GOVERNMENT'S PLANS TO IMPORT ENERGY CROPS WILL REQUIRE MILLIONS OF HECTARES OF LAND OVERSEAS

The UK Government, on the other hand, wrote in its recent Biomass Strategy that it would prefer to import most of its energy crops from overseas (rather than grow them in the UK).

The volume of energy crops the Government wants to import every year by 2050 would require up to 2.4 million hectares of land overseas to grow them. But there is no way to ensure that this much land is available to grow energy crops.

There is no guarantee that growing these energy crops would not destroy natural areas, displace food production and/or cause water scarcity, including in developing countries already suffering from food and water shortages. Climate change will also severely impact food production in some places - if it were to occur in multiple locations at once it could have [severe consequences for global food prices or food availability](#).

THE GOVERNMENT ITSELF RECOGNISES IT MIGHT RUN OUT OF BIOMASS

Even the UK Government itself recognises that it might not be able to obtain the amount of biomass it proposes in its energy plan. Indeed, the Government's [Biomass Strategy](#), released in 2023, acknowledges that by 2050 the UK may only have access to 62% of the biomass it needs to achieve net zero (or 500 out of 800 Petajoules (PJ) of biomass). This could severely undermine the UK's power, heat, transport, and industry sectors, placing the country at significant risk. The only option at this point would be plugging this massive gap with gas – and lots of it. In fact, if the UK filled a 300PJ shortfall of biomass with gas, it would add 39% to the UK's 2050 gas demand. Acquiring this gas at the last minute could be costly, or even impossible. This is the opposite of energy security.





CONCLUSION

The UK Government has made energy security one of its priorities, stating that it hopes to reduce the UK's reliance on energy imports and grow domestic supplies of affordable energy.

Increasing the country's reliance on imported biomass - whether that's wood pellets from other countries' forests or energy crops grown in other countries - is the opposite of energy security.

If the UK really hopes to enhance its energy security, it must reduce reliance on bioenergy and invest instead in rapidly scaling up home-grown and reliable renewables (e.g., wind and solar), energy storage to help capture excess generated energy, and energy efficiency measures that will lower energy demand and energy bills in Britain's draughty homes.

Imported wood pellets and imported energy crops are likely to become more expensive over time, harder to find, and will impact on either the UK's or other countries' food security and nature.

Appendix: Methodology

Bioenergy and UK tree planting

In 2021, Drax [burned 8.4 million tonnes of wood](#), of which 4.68 million was from the forest (the remainder was waste wood from sawmills and agricultural residues) – branches, tops, bark, roundwood, thinnings (55.2% of its total feedstock). This amounts to 10.48 million green tonnes of wet wood. Using figures from the US Southeast (see Endnote 9 [in this paper](#)) and extrapolating them to Drax's harvesting globally (although recognising that green tonnes/acre will vary from region to region), this means approximately 112,722 acres (45,616 hectares) of forest were logged to supply Drax in 2021. The forests being felled are often sensitive ecosystems that are crucial

for wildlife, from U.S. bottomland hardwood forests, to the Canadian boreal, to Natura 2000 forests in Estonia.

This is being subsidised by UK taxpayer money and is juxtaposed with the Government pledging to [create 30,000 hectares](#) of new trees in the UK every year. Drax's US logging activity surpasses the rate at which the Government intends to plant trees by 1.5 times. Even then, the UK is nowhere near to actually meeting this target, [only creating 13,840 hectares](#) of new woodland in the winter 2021-22 planting season. This means that globally, Drax is cutting down around three trees for every tree the UK is planting.



UK biomass imports of energy crops and their land use requirements

Miscanthus (which requires the least land per PJ of any energy crop) [produces 204GJ \(0.00024PJ\) per hectare](#).

Meanwhile Transport and Environment say that energy crops (in general) produce approximately [102GJ \(0.000102PJ\) per hectare](#).

To obtain 245PJ, somewhere between 1,020,833 hectares and 2,401,960 hectares are needed. The UK is proposing to import energy crops from overseas that have somewhere in the order of this land requirement.

In 2022, the UK grew cereals (barley, oats, wheat) [on 2.6 million hectares of land](#). As such, the UK's energy

crop imports in 2050 could need almost the same area currently used to grow cereals in the UK (similar to the size of Wales). There is no indication where this volume of energy crops would come from – it might be from countries where land is scarce or food and/or water is in short supply. But if the price for energy crops is high enough, it could drive conversion of land from food production to energy crops or from nature to energy crops.

UK wheat yield in 2022 was 8.6 tonnes per hectare. So 2.4 million hectares is enough to grow 20,656,856 tonnes of wheat. That's a lot of wheat, and enough to make billions of loaves of bread and feed millions of people for a year.

If the UK runs out of biomass it will need a lot more gas to fill the gap

By 2050 there could be a shortfall of 300PJ of biomass [according to the UK Government's new Biomass Strategy](#) (a 300PJ gap between the biomass available to buy and import and the biomass needed to achieve net zero).

Filling a gap of 300PJ would require [294 billion \(0.2 trillion\) cubic feet of natural gas](#).

In 2021 UK natural gas consumption was [2.7 trillion cubic feet](#). By 2050 the UK's demand for natural gas will [have fallen to 739 billion cubic feet \(18mtoe\)](#). So plugging a potential biomass shortfall of 300PJ could increase the UK's demand for gas by 294 billion cubic feet, or by 39%.

