

Consultation questions

1. Do you think the government should intervene to create a support mechanism to help biomass generators transition to power BECCS?

Just Transition Wakefield does NOT think the government should intervene to create a support mechanism to help biomass generators transition to power BECCS. The reasons for this are numerous and set out briefly below.

The government's case for a support mechanism in the form of bridging subsidies for biomass in the lead into power BECCS is lengthy but flawed. The government case depends on biomass generation being:

- Low or zero carbon
- Sustainable
- A reliable, secure supply
- Affordable

These assumptions then support the secondary assumption that power BECCS is

- Flexible and dispatchable
- Mature technology
- Part of a cost-effective route to net zero

We challenge these assumptions.

Biomass generation

- Low or zero carbon.

During the recent Drax planning enquiry, the Drax representatives admitted that biomass generation is NOT zero carbon or carbon neutral, but **“zero rated”**. The language is important, indicating clearly that this is a bureaucratic accounting device, not a measure of atmospheric emissions. In fact, because wood is less energy dense than coal, emissions/MWh generated are higher for biomass than for coal, so that Drax, for example, is still the UK's biggest single carbon dioxide emitter.

The wood pellets burned in biomass power stations come from a mix of waste (thinnings, offcuts, branches) and whole trees (considered uneconomical) but virtually all comes from clear felling. When land is clear-felled, the soil is bare and loses its soil carbon through oxidation and microbial activity.

The felled timber needs transporting, grinding, drying (often in methane powered kilns), compressing into pellets, transporting to ports, across oceans, and from ports, before burning. Every stage summarised here creates atmospheric carbon dioxide emissions.

Assuming that the cleared land is replanted (not a given in the southern US), there is an underlying assumption that the emitted carbon from the soil and the combustion will be recaptured in the growth of new trees. Research has clearly shown that the recapture period for offcuts is around 40 years, for whole trees from old growth forest, 200 years or more. The UK has a legal requirement to reach net zero by 2050, so even a recapture period of 40 years for offcuts is well beyond this deadline.

Sadly, the inexorably rising temperatures are making wildfires more intense and covering larger areas, forest pests and diseases are ripping through monoculture plantations and so it is likely that the combustion and soil emissions will never be fully re-sequestered.

There is no way that the additional processing and transport emissions can be re-sequestered without **significantly increasing** the replanted area beyond that felled, and even then it would take decades. When it is biodiverse old growth forest felled,

it becomes impossible to re-sequester the emitted carbon, because plantations are less carbon dense than the original forest, even if left to grow to (200 year old) maturity. All of this research is quoted in our planning submissions, and comes from a number of researchers including EASAC.

Therefore, even ignoring the solipsism of carbon accountancy rules, it is clear that biomass burning is neither zero carbon nor particularly low carbon.

Finally, none of the carbon accounting systems record the sequestered carbon that **would** be accrued **if** the trees were left standing, which is a further loss on the balance sheet.

The fact that burning biomass is not carbon neutral means that any carbon dioxide captured by CCS will be storing process emissions, not creating negative emissions. The most you could hope for is that the CCS turns power BECCS carbon neutral, but that is not a given. It would appear that selling carbon credits on this basis will be a fraudulent activity.

- Sustainable.

There are two sides to sustainability: climate emissions and re-sequestration (see above) and biodiversity.

We hardly need to point out that the world is experiencing a huge biodiversity crisis, sometimes referred to as the sixth mass extinction, sometimes as the ecological emergency. There are two aspects to this biodiversity crisis. First, the huge loss of species in recent decades through extinction, accelerating as habitat loss and climate change accelerate. Second, the reduction in population of the surviving species.

Irrespective of one's understanding of our relationship with nature, it is undeniable that humans and nature are interdependent. Without wild species of plants, animals, insects, fungi and the many classes of microbe, humanity would lose waste disposal, fresh water, predictable weather systems... Whether you classify nature as a monetised ecosystem service to humanity, a moral and spiritual equivalent, or something in between, we are interdependent. The preservation, conservation and restoration of nature and natural systems is subject to global agreement and national legislation. We are obliged, in every sense, to act on nature.

In order to apply this to the biomass (and forestry) industry, we need firstly to distinguish between two types of forest: managed, typically monoculture, woodlots, grown as plantation for commercial reasons; natural or naturalised, old growth, biodiverse forests, essential as biodiversity hotspots and home to many endangered species.

We believe that all old growth, naturalised, biodiverse forest should be protected from commercial logging. Unless badly degraded, such forests have a wide age range of trees, from young seedlings to dead and dying trees, all providing habitat for different species, all essential ecological niches within the whole ecosystem. Commercial forestry regards such forests as "low value" because there are a lower proportion of mature trees suitable for sawmills. The value of these forests is measured in species richness not lumber value, and through the many nature protection and restoration treaties, these should be protected because their biodiversity value far outweighs their commercial lumber value. Therefore, any woody biomass sourced from such forests must be classed as unsustainable. This would exclude significant parts of the Canadian forests, much of the coastal and river swamp forests in the south eastern US, and swathes of forest in central and northern

Europe. We argue that clear felling of these forests should not be allowed, and therefore must not form any part of the wood pellet supply chain.

We accept that plantations do not have the same biodiversity value, and can supply lumber for the most important uses, including construction, furniture, some paper and chemicals, etc. There is a debate to be had whether waste from such plantations should be returned to the soil to maintain soil carbon and soil life rather than burned for energy, but it is clear that any sustainability criteria for wood pellet derived from such plantations would be easier met than from real ecological forests. That said, there are other problems deriving wood pellets from such plantations.

- A reliable, secure supply.

One biomass power station alone, Drax, consumes more pellet each year than the entire forestry output of the UK. Almost all biomass burned in UK power stations is therefore imported. There are a number of factors that indicate that this is neither secure nor reliable.

There is a finite supply of forest product, with many competing pressures. The world is still struggling to halt deforestation, and reforestation projects are typically protected for biodiversity, leaving only plantation woodland available. This finite supply has to provide construction timber, paper, furniture, and more, as well as companies exploiting the resource for wood pellets. As pressures on forests grow through the coming years and decades, it is entirely predictable that remaining forests will be classified for either nature or commercial exploitation, and the greater social benefits will be prioritised. This is inevitable to protect a shrinking resource. Subsidising a product that is predicted to be under upward price pressure is market madness, and too great a burden to hang around the public neck.

Biomass burning for power is currently expanding, globally, but the raw material for this industry is not. At some point, the timber producing nations are likely to protect their pellet supply for their own power generation. This is a further upward cost pressure, and again, not the basis for planning a long term industry. A biological resource is NOT a fossil fuel where additional reserves can be sought.

Shipping costs are significant in importing wood pellets from North America and as shipping is decarbonised, costs are more likely to rise than fall. Further upward cost pressures.

- Affordable.

We believe that the predictable cost pressures, outlined above, make it clear that despite the already high price of wood pellet burning, the predictable future is of further price rises.

When we consider the current subsidy regime, we question whether it is currently affordable. Taking the example of Drax, simply because it is in our own Yorkshire and Humber region, Drax has been in receipt of subsidies for a decade. Taking a school trip to Drax in 2014, the engineer explained that without subsidy they would not be burning wood pellet. We note that Drax has not always made a profit, in recent years but when it does, the profit is of the same order as the annual subsidy. We contest that Drax, and by extension the biomass power industry, is not profitable as a standalone industry. The principle of subsidies to support fledgling industries is well established. If industries need a permanent subsidy regime just to survive, they are not financially viable. The only justification in a market economy for permanent

subsidy of an industry is that it is so strategically important that it cannot fail. The biomass power industry does NOT pass this test.

- Flexible and Dispatchable.

This phrase refers to the ability of a power source to be increased or decreased, or even switched on and off at short notice to balance a variable grid reliant on renewables.

Unabated biomass power is as dispatchable or flexible as unabated coal, because both operate on the same principles. Such flexibility does require the boiler units to be kept burning to be able to rapidly raise the boiler temperature, so it is not efficient in terms of fuel use, cost or emissions, but technically possible.

Power BECCS on the other hand, is different, because it has a Carbon Capture and Storage unit “bolted on”. The Drax planning process for the BECCS project necessarily went into this question in some detail. Under questioning from the inspector, the Drax representatives made it clear that power BECCS is suitable only for baseload generation because of the time delay in starting up and shutting down the CCS unit. Dispatchable power would only come from the remaining two **unabated** units.

It is clear that the whole power BECCS strategy is based on a false premise, and a false promise of flexible, dispatchable power to balance a renewable grid. On this basis, there is no justification for implementing power BECCS and therefore for extending the subsidy regime.

Thankfully, there are other, far more renewable and affordable grid balancing technologies. We respectfully propose an investment programme into the full range of available grid balancing technologies, with a phasing out of biomass generation in parallel, with a just transition plan for the entire workforce. Only this will deliver affordability, energy security and genuinely zero carbon power in operation.

- Mature Technology.

Government officials seem to be relying on the industry narrative that CCS is a mature, reliable and effective technology. The evidence from the industry does not support this narrative. There have been numerous studies into the effectiveness, affordability and reliability of CCS systems.

Effectiveness. The planning enquiry into Drax’s power BECCS project claims a 95% capture rate. Detailed research and enquiry narrows this down to an average of 95% capture rate under normal operating conditions – i.e. excluding the power up and power down phases which will burn unabated. “Successful” CCS systems on fossil fuel power stations have managed, at best, a 60% capture rate, with the vast majority being cancelled pre or post construction.

Reliability. Operating CCS systems have been dogged with technical failures, particularly those based on amine solvent systems. There is no evidence that CCS systems across the world are reliable.

Mature. Our understanding of a mature technology is one that is widely available, where systems are successful and there are multiple systems in operation across the world. CCS does not fit this description. Further, the Drax system is described by Drax Power as a novel solvent system, they distance themselves from other industry failures by saying theirs is a new system – it can’t work both ways.

We are clear that however it is spun, CCS and BECCS is not reliable, effective or mature technology.

- Part of a cost-effective route to net zero.
We must face honestly that mitigating runaway climate change is difficult, and requires the rapid phase out of carbon intensive fuels – yes, fossil fuels, but also biomass. Synthesising the above evidence, we are clear that biomass burning emits significant amounts of carbon dioxide to the atmosphere, and it takes between 40 and 200 years to recapture that carbon biologically – against our net zero target of 2050. Then, we consider Carbon Capture and Storage that at best is likely to capture 60% of the emissions during operation, so less than this when start-up and shut-down running unabated are included, and so we are confident that power BECCS will not even be carbon neutral, never mind carbon negative.
- Finally, this whole consultation is working on the assumption that all biomass will be burned in CCS fitted boiler units – yet we know that Drax are planning to only retrofit two of their four units, leaving two units continuing to emit unabated (uncaptured) carbon. The consultation does not make it clear when or even if subsidies for unabated biomass burning will end, because the proposed bridging subsidies are to continue to burn biomass without CCS for the foreseeable future. This will not lead to any reduction in our emissions from these sources.
- We have made it clear that power BECCS is not cost-effective and is not a route to net zero and cannot be used to mitigate emissions elsewhere in the economy. Thus it cannot be part of a cost-effective route to net zero. Therefore, the case for bridging subsidies cannot be supported.

2. Do you agree with the success factors we have identified?

No, we do not agree with the success factors identified.

- The value of the generation capacity being available to help ensure the security of supply.
The remaining three years of the current subsidy regime should be sufficient to replace the small percentage of biomass energy to the grid with a combination of renewable generation and grid storage and balancing technology. We are in an emergency, and three years should be sufficient to roll out that amount of new generation. With a proper programme of demand reduction and new generation, security of supply should be guarantee-able beyond 2027 without bridging subsidies.
- the direct cost to the consumer, noting that biomass is a relatively expensive fuel source. We anticipate that a support mechanism would be funded through a levy on consumer electricity bills, consistent with the approach taken for existing CfDs. We hate to point out the obvious, that biomass is an expensive fuel source, and one that is under increasing upward price pressure. We also note that the consumer has been hit by huge hikes to both energy unit prices and standing charges, so any further upward pressure on bills to subsidise systematic, on-going ecological damage is not acceptable. Consumers are already locked into additional bill hikes to support the planned new nuclear capacity, adding further biomass subsidies will be unacceptable.
- the extent to which generators are incentivised to generate when power is most valuable to the consumer, noting the increased capacity of intermittent generation expected to come onto the system in the late 2020s and early 2030s.
As we have already highlighted, power BECCS is not suitable for intermittent generation, only for baseload. Existing unabated BECCS does manage some

intermittent generation, although at cost, so keeping this until 2027 as currently planned makes sense to allow the additional capacity to be built out. **Expecting power BECCS to deliver grid smoothing to manage intermittent generation is pointless, because it cannot. Therefore, extending the current subsidy regime is the wrong policy, because it will not lead to the intended benefits.**

- the carbon benefits of biomass generation over that of gas and other fossil fuels, dependent in part on the extent to which the policy does or does not lead to any crowding out of other intermittent renewable generation.

There are no significant carbon benefits of biomass generation over gas or coal generation. Atmospheric emissions from biomass are even higher than from coal, because biomass is less energy dense. Looking at the health impacts on the biomass workforce and the communities that host pellet mills, alongside the ecological costs already highlighted, indicates that biomass generation is not part of the zero carbon generation solution, any more than gas, oil or coal.

There are grid smoothing technologies available, not just battery storage.

- The consultation document states that “**The mechanism should be designed to manage the changing circumstances which may affect an eligible generator’s success in transitioning to a future power BECCS system.**”, and highlights the risk that an eligible generator may be unsuccessful in transitioning to power BECCS, or choose not to.

First we note that currently, Drax only proposes to transition half of its output to power BECCS, and we question what will happen to the two unabated units. We also note that the successful operation of the CCS system is not guaranteed despite the industry’s high hopes, and we question what happens when or if the CCS system fails to deliver. Based on the CCS industry record so far, this is an entirely likely scenario. So we are clear that it would be better by far to phase out what is clearly an unsustainable industry and rapidly replace it with newer, greener generation capacity.

3. Are there additional factors we should consider?

We have provided enough evidence already that the proposed bridging subsidies are expensive, unnecessary and environmentally destructive.

4. Do you agree with the options above being included as preferred options? If no, please articulate why the option is not suitable and provide evidence where appropriate.

We have already made it clear that we do not think there is any justification for continuing subsidy regimes beyond 2027, however, we expand on this a little below.

Option 1 – Unconstrained CfD.

The document claims that this model would be closest to the current CfD model. Under this model, most recent figures for Drax and Lynemouth CfD units are around 20% and 17% respectively. It is only the ROC subsidised units that currently generate around the 80% mark. We are not clear why you think that this CfD only model will result in higher generating periods than currently happens. For the units to operate nearer the 70-90% load that you predict, the strike price awarded would have to be considerably higher than at present, which sounds like costing the consumer more. We would not support any model that costs the consumer more.

Option 2 – CfD with a “generation collar”.

The impact assessment for this option gives an illustrative figure of 30% to 60%, but even running at 30% capacity would be far more generation and far more timber burned than the current CfD funded units. It seems highly plausible that this model could lead to even more pellets being burned than now, which is not in the collective interest.

Option 3 – availability payment.

This option is so thin on design that it does not seem a serious option. However, if we interpret it correctly, it requires Drax and Lynemouth stations to remain alight, on tickover, ready to be put on full power at short notice, rather like Eggborough was operated before it closed, and as Radcliffe on Soar has operated in recent years. It therefore pays the stations to remain alight and to store fuel, ready to be brought into generation when the strike price is particularly high. This is paying for significant emissions without generation to justify, and seems illogical for this design of power station. However, despite the failings of this proposed model, it may deliver lower emissions (and therefore reduced forest destruction). However, it does not seem a serious option.

Option 4 – regulated margin.

We think there are flaws in this model. Firstly, as Drax owns a considerable slice of the world's wood pellet production, it could artificially inflate prices. Secondly, the imminent collapse of Drax's other major supplier, Enviva, is likely to cause a price spike, and so either way, this does not seem a realistic model to control costs to consumers.

As we have indicated previously, we do not favour any subsidy extension, however, of the models presented for consideration, option 4 carries significant risk; option 3 could cost the consumer less but seems to be included as a tokenistic entry; option 2 we think may result in burning more fuel than you estimate, and option 1 may burn less fuel than you estimate. However, as you have not considered the impact of removing ROC, it is hard to make a judgement other than none are ideal.

5. Do you prefer one of the options as described above? If so, please provide your reasoning and any evidence to support.

See above – we do not favour any option.

6. Do you have views on approaches we should consider as part of our options to ensure generators are not overcompensated?

If you continue with this ecological madness, then you should put an annual cap on subsidies to biomass generators, so that consumers are not left struggling with external costs beyond their control.

7. Do you have any material comments relating to the mechanics of each option or the outline evaluation as articulated? If so, please provide details.

We have nothing further to add.

8. Do you agree that these options should be discounted and considered as non-preferred? If not, please provide rationale and any evidence.

We agree that these options should be non-preferred. The second option is pointless. Rather than mothballing, it would make more sense to use the remaining three years of the existing subsidy to implement a closure plan that includes a just transition plan for the

workforce and the local economy, and that focuses on alternative renewable generation and both industrial and domestic demand reduction.

We do not accept the first option because the current plans for power BECCS at Lynemouth are not yet developed, so these bridging subsidies could be in place for decades. Plans do exist for Drax, but the extension period requested also means that the bridging subsidies could be in place for a decade, the CCS could end up not being built at all, and even if it is, it will lock in unsustainable, expensive, high emitting power into the UK grid to 2050 and beyond.

9. Do you agree with the eligibility criteria and assessment process set out? If no, how should they be adapted to be more suitable?

We do not accept the eligibility criteria.

The truth is that there are far better candidates for trialling CCS systems on than biomass power stations. The ecological damage caused by clear felling for pellet production, the ongoing high emissions of biomass generation and the loss of verifiable active carbon sinks makes no sense.

The only form of biomass generation that has a chance to get close to sustainable is local, small scale biomass generation, based on short rotation crops (ie. Regrowth in less than 10 years with no loss of soil carbon).

All systems based on woody biomass are unsustainable by all rational criteria, and the fact that the UK is not alone, but part of a mass global market in the products of deforestation, should mean that we leave this practice behind at the earliest opportunity – 2027.

10. During a transition period from biomass electricity to power BECCS, do you think that the GHG criteria should be strengthened? If so, how? Please provide evidence to support your views.

We have already explained clearly why the UK should not transition from biomass to BECCS, because we do not accept that there is an honest measure of GHG emissions that will demonstrate zero or negative emissions.

However, there does need to be a full, realistic, measured and verified counting of emissions across the entire supply chain, and with verified regrowth and re-sequestration data, to feed into the carbon accounting system for both unabated biomass generation and power BECCS. Without this transparency, we have to assume that real emissions remain uncounted, whilst subsidy is given for hidden emissions. This is not a way to dramatically cut emissions, quite the opposite.

All biomass projects should be run only on material that is verified as being sustainable. In other words, 100%.

11. As part of the proposed transitional support arrangements for large-scale biomass generators that plan to transition to power BECCS, do you think that we should increase the minimum percentage of woody biomass that must be obtained from a sustainable source? If so, what should be the minimum percentage be set at? Please provide evidence to support your views.

Obviously, 100% of woody biomass should be completely sustainable. Anything else is worsening the climate and ecological emergencies. However, with realistic sustainability criteria, there would be no industrial burning of wood.

We can afford to close this unsustainable and dirty industry down in 2027.

12. Are there any additional sustainability criteria we should consider strengthening specifically as part of the proposed transitional support arrangements?

Yes.

Firstly, full and accurate counting of emissions at each stage of the supply chain from felling to combustion, including verification of the carbon sequestration rates of replanted forest, and the continued health of the replanted forests over decades long timescales to ensure that they have not succumbed to disease or fire. Without this level of precision and accuracy, there is no basis for claims of sustainability.

Secondly, the criteria for extraction from biodiversity hotspots need strengthening. At present, it is legal for old growth forest in British Columbia to be licenced for clear felling. Legality does not denote sustainability. The same applies to the swamp forests of the south eastern US. We need **our own sustainability criteria** to apply independently to our supply chains, irrespective of national law in the timber supply countries. Anything else leaves this industry open to legal challenge when laws of ecocide are enacted in jurisdictions, which is only a matter of time.

Finally, if you decide against reason to offer the continuation subsidies for burning forests, then **contracts need to be written to include future strengthening of sustainability rules, so that the highest standards always apply. This must include the option to stop the subsidies if the supply chain fails to meet a new standard at any time in the future.**

However, we observe that if you properly design sustainability criteria to be 100% renewable, then it seems unlikely that there will ever be a verifiable supply.

13. Do you have any comments on the proposed amendment to the definition of an eligible generator to specify that generating stations which are already generating electricity are eligible generators?

This seems tautological and designed to maintain the status quo rather than deliver zero carbon electricity to the grid or protect global forests, biodiversity and carbon sinks.

14. Do you have any comments on the proposed amendment to the definition of an eligible generator to specify that biomass conversion stations are an eligible generating station?

Unless there is a requirement on eligible stations (in reality, just Drax and Lynemouth) to actually retrofit CCS within a set timeframe, then these so called transitional subsidies are actually just an extension of business as usual subsidies.

Therefore we are clear that should these bridging subsidies be granted, they should only be granted to units with clear, time limited and verified plans to install carbon capture and storage. Any units without such commitment should not receive subsidy after 2027. For further clarity, Drax proposes to retrofit CCS to “up to two” of its four biomass units. Therefore, two units would definitely be excluded from bridging subsidies, and the other two would need additional verification that CCS was going to be applied to **both** of them before awarding bridging subsidies.

15. Do you agree with the government's proposal to enable the Secretary of State to issue a direction to a CfD counterparty to modify any section 10 contract to reflect updated sustainability objectives?

We agree that the SoS must be able to update CfD contracts with updated sustainability criteria. However, we go further, and require that should the SoS be minded to grant these subsidies to both Drax and Lynemouth, that if or when international agreements on emissions or biodiversity require, that the subsidies can be ended by the SoS. To not add this requirement is tying the hands of a future Secretary of State and forcing continued subsidy on consumers, long after it is known that industrial scale biomass burning is unsustainable.

16. Do you have any comments on the proposal to make amendments to Contracts for Difference legislation consequential to the design of the support mechanism?

We think that amendments to the CfD legislation should be made anyway in order to give future Secretaries of State the ability to respond to changing conditions.