



The Biomass Delusion

A Briefing by the



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How the UNFCCC carbon accounting system drives the biomass energy problem, and ways to fix it

The Problem

Big biomass burns wood in huge volumes for electricity and industrial heat. Large scale use of forest biomass adversely affects climate, biodiversity, communities, and the transition to low carbon renewables.

Burning wood for energy is emissive. In fact burning wood for energy produces at least as much CO₂ as burning coal per unit of energy produced, and usually more.

Yet many countries treat biomass energy as zero carbon or as carbon neutral and therefore give it financial and regulatory support as a 'renewable' energy.

Not zero emissions: Emissions do not appear in energy sector accounts – misleading

Carbon emissions generated by combustion of biomass (and other forms of bioenergy) for energy generation are not reported nor accounted in the energy sector of the consuming country. All other energy sources – all emissions from the combustion of fossil fuels -- are counted in the energy sector. But not biomass. This creates a false impression of zero emissions for biomass energy in comparison to the emissions of burning fossil fuels.

Instead, emissions from biomass burning show up only as part of an overall change in forest levels. There's no requirement that countries burning biomass count emissions at the smokestack. These factors combine to provide the false signal that biomass power generation is emissions free for energy production. Yet we know that biomass power is a heavy emitter of CO₂ and other polluting gases.

Many countries misconstrue this accounting convention to mean that biomass energy is actually zero emissions. They classify biomass as a source of 'renewable' energy, and treat it as zero carbon.

There are many cases where biomass emissions are not counted at all. When raw wood is processed into pellets, the emissions associated with processing usually aren't assigned to biomass. When the woody biomass is imported from a country that does not account for land sector emissions under the Paris Agreement, this also creates an accounting loophole.

So in addition to the problem that energy-consuming countries are taking no responsibility for the emissions their activities generate, emissions in the land sector are themselves grossly understated.

Not carbon neutral – regrowth is uncertain and ultimately much too slow

The claim is often made that generating energy from forest biomass is carbon neutral. The assumption is that the trees and forests will grow back as part of the natural carbon cycle, reabsorbing the carbon emitted from burning. At that point biomass energy would become carbon neutral. This is an unsafe assumption.

A carbon debt has been created when the biomass is burnt. *If* the expected regrowth happens it will take from decades to centuries to pay back that carbon debt, depending on the type of wood feedstock burnt and the ecosystem or manmade planting from which it was logged. In the meanwhile the GHGs emitted are in the atmosphere contributing to making global warming worse.

The Paris Agreement contains important timelines for action in reducing emissions that must be met to have any hope of restraining climate change to 1.5 or 2 degrees of warming. These are at 2030 and 2050, way before the volume of emissions of biomass burning could ever be captured through forest regrowth (sequestration). And the burning continues year on year.

It's not good science for biomass advocates to claim that forests growing somewhere else will make up for the biomass burning emissions. Those forests were growing anyway, whether or not wood was logged and burnt for bioenergy. The IPCC was very clear about this, saying:

*"If bioenergy production is to generate a net reduction in emissions, it must do so by offsetting those emissions through **increased net carbon uptake of biota and soils**"^[1] (emphasis added).*

There is no claim from industry, nor effort to quantify, any such additional uptake of carbon. They simply rely on a free ride contributed by some other forest, ignoring that every bit of carbon sequestration offered by such forests is already valuable in pulling carbon from the atmosphere and increasing terrestrial carbon stocks. It is not sound science to claim it for biomass, and neither is it sound policy to trade off valuable forest carbon sequestration against wood-fired power.

Does it really grow back? Further, nobody is checking the assumption that the forests or plantations will grow back to what they were before.

The Consequences

The failure to require accounting for large emissions of combustion of biomass in the energy sector is driving expansion of the biomass energy industry. Policies to incentivise and subsidise woody biomass combustion for energy generation have been implemented because of misapprehensions that it will contribute to emissions reduction. As a result there is:

- (i) **Dramatic, ongoing growth of biomass energy generation** with wood pellets comprising the major commodity supplying it. Global supply of and demand for forest biomass is likely to exceed a 250% increase to over 36 million tonnes that was predicted to occur between 2017-2027, having already doubled to 14 million tonnes in the preceding decade.
- (ii) **Harm to the clean energy transition.** Biomass energy, predominantly forest biomass, dominates 'renewable' energy production, dwarfing wind and solar and undermining their prospects by soaking up subsidies that should be applied to such genuinely low emissions technologies.
- (iii) **Global inequity and injustice as responsibility for emissions is externalised** from the energy consumer to the forest product producer – a serious issue when forest biomass is traded from one country to another. This will escalate as forest biomass is increasingly sourced from outside the big biomass energy consuming blocs of Europe, the UK, South Korea and Japan and the global south is drawn into the supply chain. **Developing nations will bear emissions responsibility when biomass sourced from them is burnt in developed countries who will claim emissions reductions.**
- (iv) **Expanding monoculture plantation establishment.** Conversion of forests and other ecosystems to industrial monoculture tree plantations for biomass is especially harmful entailing conversion of natural ecosystems and agricultural land with serious impacts on communities, natural ecosystems, food production, water availability, and the climate.
- (v) **Undercutting the contribution of natural forests to emissions reduction and removals of carbon from atmosphere.** Using forest biomass for energy entrenches, intensifies and expands logging, degrading forest ecosystems and resulting in large immediate emissions whilst undercutting the ability of those forests to remove carbon from atmosphere and sequester it. Biodiversity and soils are depleted, as is forests' ability to deliver ecosystem services like clean drinking water, flood protection, and clean air. These increased impacts come at a time when we recognise that rights-based protection and ecological restoration improve the health and well-being of forests and make them more resilient to climate change and other environmental disturbances.
- (vi) **Undermining of community rights and interests** – Demand for biomass, and escalating monoculture plantation establishment cited above, exacerbates conflicts over land and forest resources, including land grabbing. This threatens the rights, interests, lives, livelihoods and cultural values of Indigenous and tribal peoples and local communities as well as businesses relying on forest resources. The negative effects can also impact food security for the wider populace.
- (vii) **Misapprehension that Bioenergy with Carbon Capture and Storage (BECCS) could be carbon negative** when in fact biomass energy is highly emissive, as explained earlier. The claim to 'negative' emissions relies on biomass energy being carbon neutral, which

it is not. This is in addition to serious questions over the feasibility of carbon capture and storage (CCS).

(viii) **Erroneous claims to abatement of coal-fired power** via co-firing with woody biomass. Under the UNFCCC LULUCF accounting rules, co-firing coal with woody biomass increases energy efficiency by reducing emissions – not because actual emissions are reduced but simply because the emissions of combustion of biomass do not appear in energy sector accounts. Therefore forest biomass must not be a recognised method of abatement, a position already adopted by the OECD.

Solutions

Here we focus on the role of carbon accounting, and on solutions to the carbon accounting flaws driving the biomass energy industry. It is important that carbon accounting generates a signal that biomass burning is emissive. That would flow through to ending subsidies and incentives based on misapprehensions of zero emissions or of carbon neutrality. Such accounting solutions should not interfere with accurate accounting of carbon sequestration in forests.

(i) **Energy sector accounting of emissions of combustion**, as with fossil fuels: It is ideal that the accounting reflects combustion emissions to generate energy occurring in the energy sector. This represents reality and resolves the false signals of zero bioenergy emissions.

(ii) **Consumer takes emissions responsibility**: Where forest biomass is traded from one country to another, the carbon accounts should show the emissions actually created in the consumer country. A process to reconcile these emissions against land sector removals in the producer country is then required.

(iii) Alternatively, **woody biomass is identified as an HWP - 'harvested wood product' and the atmospheric flow approach is utilised** to follow biomass to where it is burnt. The combustion emission is then recorded in that country. This is a less ideal but more easily implemented solution, and does achieve the aim of consumer countries taking responsibility for emissions.

BEWARE OF FALSE SOLUTIONS!

'Sustainable Forest Management': Sustainability is important for many ecosystem values, but it does *not* address the large, immediate emissions of biomass energy production or the substantial amount of carbon lost through logging natural forests. Impacts on climate change are not addressed in SFM.

Definitions of "waste" and "residues": The scale of biomass energy production dictates use of large volumes of wood, much of which comes direct from the forest. Use of whole logs has been documented in Europe, the US and Canada – all defined as "residues". Pellet manufacturers want the densest materials they can find: namely, whole trees.

A harvested wood product (HWP) provision already exists in LULUCF rules. However, this provides for 4 differing approaches to reporting and accounting, which is problematic because if trading partners use different HWP accounting approaches, double counting or non-counting of emissions may occur. **Standardisation to use of the atmospheric flow approach** would be required to resolve those issues while ensuring that consumer responsibility for emissions occurs.