Environmental Paper Network
BIOMASS ACTION NETWORK

Inputs for call on 'Technologies related to climate change and their impacts on human rights'

The Biomass Action Network (BAN) thanks the Special Rapporteur on Climate Change for inviting inputs on 'Technologies related to climate change and their impacts on human rights.' BAN comprises over 230 NGOs located across 70 countries and our position statement, the Biomass Delusion, summarises the harm caused to the climate, forests, people, and the clean energy transition, by the large-scale burning of woody biomass for energy.

This submission draws attention to the human rights impacts of technologies linked to, and often reliant on, large-scale ('modern') biomass energy, including Bioenergy with Carbon Capture and Storage (BECCS), biomass co-firing, biomass based e-fuels, industrial charcoal for "green" steel and biochar for carbon dioxide removal (CDR). We also make a short comment on AI data centers in the context of biomass energy.

The human rights impacts of burning woody biomass for energy

Because the aforementioned technologies all rely on burning woody biomass in power and heat plants, it is important to start by summarising the human rights issues that result from this form of energy generation.

Human rights impacts occur throughout the biomass supply chain, on a global scale

Treating woody biomass as a renewable "transition fuel" in efforts to defossilize economies has triggered major subsidies and incentives, accelerating demand. This has created a large global trade in wood pellets and woodchips as commodities. The biomass supply chain extends from the forests or tree plantations from which woody biomass is procured, to the processing facilities that turn the biomass into woodchips or pellets for burning, and finally to the energy generation facility that burns the biomass. Due to this, impacts on people are occurring on a global scale and frequently in locations far from the actual energy generating power plant, thus outsourcing many of the negative impacts to producer regions.

Impacts from biomass sourcing: Landgrabbing and loss of access to resources

Woody biomass is sourced either from natural forests or monoculture tree plantations and both are associated with human rights abuses, including: land and water grabbing and dispossession, gendered impacts affecting women, increases in zoonotic diseases, conversion of community / agricultural land into plantations, and loss of access to clean water, medicine sources, and food, resulting in adverse impacts on food security and food sovereignty.

In Indonesia, biomass projects have stripped local and Indigenous communities of access to forests essential for food, medicine, cultural practices, and livelihoods. Examples include the Indigenous Suku Anak Dalam in Jambi, who have lost gardens, forests, and fields to bioenergy development without proper compensation, and the O Hanga Manyawa Indigenous people in North Maluku, who were unaware of a project on their ancestral lands, and received no information post-permit issuance. On Buru Island, communities have lost forests and farmland to plantations developed by companies that ignored Free, Prior, and Informed Consent (FPIC) protocols. On top of this, a 2024 report found that local communities living in Indonesian plantation development areas received no benefits from biomass energy; all output was exported to Japan. These examples demonstrate how demand for woody biomass directly threatens the rights of indigenous, tribal, and local communities.

Impacts from processing and combustion: Pollution and health issues.

Biomass manufacturing and combustion facilities are often sited in disadvantaged areas, where pollution worsens health and quality of life. An example of this can be found in the Southeastern United States, which is the largest manufacturer and exporter of wood pellets globally. Systemic racial injustices there have resulted in the disproportionate placement of biomass manufacturing industries in communities of colour. Pellet manufacture emits excessive amounts of potentially deadly pollutants and exposure to these chemicals has been shown to lead to respiratory illnesses, heart disease, premature deaths, low birth rates, Type 2 diabetes, strokes, Alzheimer's, Parkinson's, and lung, kidney, and bladder cancer. Southeastern U.S. residents have reported an increase in many of these health problems.

Pellet producers repeatedly violate the U.S. Clean Air Act, emitting dangerous chemicals well beyond permitted limits. A litany of examples show ineffective regulation and fines for polluting, that are woefully insufficient and do not function as a deterrent. An investigation found that wood pellet mills owned by UK energy giant Drax have violated environmental regulations 18,000 times in the US since 2014. The violations include exceeding permitted limits of toxic air pollutants, bypassing crucial emission-control technologies and releasing contaminants into waterways. Clearly this is a systematic disregard for pollution controls and for the human right to clean air and water. This is a pattern repeated around the world in areas where biomass is processed and burned.

Biomass-reliant technologies related to climate change

Technologies relying on biomass energy share the same supply chain and thus expand and exacerbate the human rights impacts mentioned above. Many also entrench fossil fuel use, despite being promoted as climate solutions.

Biomass co-firing: prolonging our reliance on coal

Despite being promoted as a strategy to mitigate emissions, biomass co-firing is fundamentally flawed. Burning wood emits as much CO_2 per unit of energy as coal, meaning that this practice does not actually reduce greenhouse gas emissions. Furthermore, co-firing allows coal-fired power stations—which would otherwise be forced to shut down—to continue operating, thereby prolonging the use of coal and delaying the transition to genuinely clean and renewable energy sources. As a result, communities living in the shadow of dirty coal fired power stations are being condemned to continued pollution exposure, and the health implications of this, for years to come.

The illusion that co-firing biomass with coal reduces emissions arises solely from the way greenhouse gas (GHG) accounting is conducted. Emissions from burning biomass are not counted at the smokestack in the same way as those from fossil fuels, creating a misleading picture of the true environmental impact. Rather than being counted at the point of combustion, emissions from biomass energy are supposedly accounted for in the land sector, where the biomass is harvested. In practice, however, land sector accounting does not break down emissions by source; it simply reflects the overall change in forest cover from a variety of causes. When countries import biomass, the emissions are ostensibly recorded in another nation's land sector accounts, making it difficult to trace accountability or accurately assess the climate impact of biomass burning. This has created a biomass carbon accounting loophole, which scientists expressed grave concern about in a recent letter to the IPCC.

Treating biomass as carbon neutral assumes that trees absorb CO_2 from the atmosphere as they grow, so burning them simply returns that carbon. However, this logic overlooks a critical temporal disconnect: while burning biomass releases CO_2 instantly, it can take decades for new trees to reabsorb an equivalent amount of carbon. This creates a 'carbon debt'—a delay in carbon sequestration that is especially problematic in the context of urgent climate action. Moreover, harvesting and burning long-lived plants like trees eliminates valuable carbon sinks—natural systems that absorb and store atmospheric carbon. When these are destroyed, not only are emissions released, but the ongoing capacity to draw carbon from the atmosphere is also lost, effectively turning a carbon sink into a carbon source.

Biomass co-firing is being deployed in many parts of the world, an example being Indonesia, where plans are underway for 52 coal power stations to co-fire with 5-10% biomass to meet Indonesia's Nationally Determined Contributions under the Paris Agreement. However, research indicates that even this relatively modest level of co-firing will result in the deforestation of millions of hectares of land for "energy" tree plantations. Rather than reducing emissions, this shift is likely to increase them, particularly in the forest and land sectors, undermining the very climate goals it purports to advance. The impact that deforestation at this scale will have on forest dependent peoples, has already been highlighted earlier in this letter.

Bioenergy with Carbon Capture and Storage (BECCS): A dangerous distraction

BECCS (Bioenergy with Carbon Capture and Storage), is the concept of capturing and storing emissions from burning biomass underground as a strategy for climate mitigation. Climate models often rely on large-scale deployment of BECCS to limit warming to 1.5°C, however BECCS relies on the same flawed assumption that biomass energy is carbon neutral and its feasibility, scalability, and cost-effectiveness are highly questionable. Even in the best case scenario, carbon is only captured at the smokestack, meaning that significant indirect and supply chain emissions from biomass production, transportation, and processing are ignored. Furthermore, BECCS is still only in the testing stage and remains unproven at scale. One of its biggest proponents, Drax, has all but abandoned the technology.

Climate arguments aside, BECCS poses significant threats to human rights, stemming from the sheer scale of the land it requires. Exactly how much land depends on the type of biomass and the

scale of the expected negative emissions, but some scenarios require an area comparable to the size of India. This would create significant competition with agriculture, driving up food prices and compromising people's rights to affordable food. BECCS also presents trade-offs between land and water usage that would dramatically increase global water demand, worsening water scarcity and undermining people's right to clean drinking water.

BECCS developments can pose indirect threats to human rights. In Brazil, biomass power plants (fueled by vast monoculture tree plantations) are increasingly supplying energy to corn and sugarcane ethanol refineries. Capturing carbon from ethanol production is an established technology, but the industry now plans to sequester this carbon and generate carbon credits. For instance, FS Agrisolutions Indústria de Biocombustíveis Ltda (FS) plans a $65 million BECCS project at its Lucas do Rio Verde refinery in Mato Grosso do Sul. The company is already securing agreements for future carbon credit sales and intends to expand BECCS projects to other regional sites powered by biomass energy.

Charcoal for "green" steel and biochar for carbon dioxide removal: flawed carbon offsetting

Large amounts of wood are used globally to make charcoal, which is utilised in the production of so-called "green steel" in Latin America. Brazil produces about 7 million tonnes of charcoal annually, using wood from eucalyptus plantations, and 90% of it is used by its iron and steel industry.

Seventy percent of Brazil's iron and steel mills are in Minas Gerais, which has the largest area of tree plantations in the country. Charcoal is mostly produced in small kilns, exposing workers to serious health risks and poor conditions. In 2022, Minas Gerais had the highest forced labour rate in Brazil, with charcoal production among the most at-risk sectors for slavery-like conditions.

In Maranhão, Aço Verde do Brasil (AVB) claims to be the world's first carbon neutral steel producer, but its operations, including in Formiga (Anapurus), have negatively affected many communities. Charcoal production throughout Brazil has caused widespread land-grabbing, conflict with communities, deforestation, loss of livelihoods, water shortages, and increased use of pesticides and agrotoxins.

Biochar, closely tied to charcoal production, is now a leading form of Carbon Dioxide Removal (CDR) in voluntary carbon markets. One of the best examples of this is Brazilian steel producer Aperam, which sells some charcoal as biochar for carbon offsets and has sold nearly 120,000 tonnes of removal credits since 2021. Aperam's charcoal and biochar come mainly from 125,000 hectares of non-native eucalyptus plantations in Minas Gerais, which have lowered groundwater by 4.5 meters since the 1970s, threatening local water supplies and livelihoods. Large-scale pesticide use has also been reported to have harmed human health.

The false promise of e-fuels based on woody biomass

E-fuels are being promoted as a climate solution for aviation, shipping and road transport. Some e-fuels, such as e-methanol and e-diesel, are produced using woody biomass as an energy source and / or as a source of carbon. E-fuels are often considered an attractive transition option because they can function as "drop-in" substitutes for conventional oil-based fuels. But ease of

substitution does not make them non-emissive or sustainable. Scaling up e-fuel production using woody biomass would require vast volumes of wood from natural forests and plantations, which would further entrench, intensify, and expand industrial logging. This would in turn have devastating implications for forest-dependent people, as well as communities, all along the biomass supply chain.

Powering AI data centers with biomass energy: a potential new driver of forest destruction

AI data centers are coming under scrutiny for their intense energy use and there is a risk that biomass energy will be turned to as an alternative to fossil fuels. Biomass power companies, such as Drax, are already positioning themselves as being able to deliver "the world's first carbon negative data centre" by hosting an AI data center on the site of their biomass power station. Increasing demand for woody biomass to fuel energy intensive infrastructure at this scale, is a pressure that the world's forests and people, surely cannot sustain.

Burning trees harms people and the climate; technologies that perpetuate this only increase such harms.

In summary; technologies reliant on burning woody biomass:

- Delay the transition to genuinely clean and renewable energy sources and undermine true emissions reductions.
- Entrench combustion infrastructure and sometimes prolong the use of fossil fuels.
- Promote a business-as-usual approach at a time when we need to reduce resource extraction and levels of consumption.
- Exacerbate and increase demand on the world's already overexploited forests
- Excacerbate and increase the human right's impacts inherent in the biomass supply chain

The priority must be:

- Recognition that the extraction and burning of woody biomass for energy at scale is unsustainable and carbon emissive
- Rapid demand reduction for woody biomass (by not deploying biomass based technologies)
- Deployment of genuinely low emission technologies such as wind and solar and increasing energy efficiency.
- Rejection of biomass-based Carbon Dioxide Removal schemes and carbon offsetting
- Protection and restoration of forests as carbon sinks and for the well-being of all life on Earth

The examples cited in this submission are just a snapshot of the negative impacts that are occurring all around the world and which are set to worsen if nothing is done to halt the biomass industry and the technologies reliant upon it. We offer to assist with any further information you may require and thank you for your interest in technologies related to climate change and their impacts on human rights.

Sincerely, Sophie Bastable.
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