

The False Promise of e-Fuels made using Woody Biomass

E-fuels are being promoted as a climate solution for aviation, shipping and road transport. There are a variety of e-fuels, such as e-methanol, e-diesel, e-ammonia, and e-kerosene (also called e-SAF, Sustainable Aviation Fuel). Some are produced using woody biomass as an energy source and / or as a source of carbon, whereas others like e-ammonia contain nitrogen and not carbon. **This brief focuses on the sub-set of e-fuels that involve the use of woody biomass in their production** and thus represent another phase of the same failed industrial biomass energy model — dressed up as innovation.



Why are they being promoted?

E-fuels are often considered an attractive transition option because they can function as “drop-in” substitutes for conventional oil-based fuels. This is particularly relevant for sectors such as aviation and shipping, which are widely regarded as hard to abate due to the limited development of viable alternatives, such as electrification of these forms of transport. Because e-fuels are compatible with existing fuel infrastructure and internal combustion engines, they could also be used in road transport, appearing to offer a simpler pathway than a full transition to electric vehicles.

But ease of substitution does not make them non-emissive or sustainable.

Why Are They Called e-fuels?

In contrast to traditional transport fuels like gasoline or diesel, which come from fossil sources, e-fuels are made from other feedstocks, using electricity as a key part of the production process. Water is split into its constituent elements, hydrogen and oxygen, via electrolysis and the hydrogen is then a building block of e-fuels.

This is why they're called “**electrofuels**” - shortened to “**e-fuels**”.

What Are The Concerns?

Proposals are to use **large volumes of wood** to produce “e-fuels,” particularly **e-methanol** and **e-diesel**. E-fuels risk becoming a major new driver of forest destruction and carbon emissions. Woody biomass may be used in two different stages of the production cycle:

- to generate electricity for **hydrogen production**, or
- as the carbon source for **fuel synthesis**

How e-Fuels Are Made

E-fuels are created in two steps:

Hydrogen production

Water (H₂O) is split into hydrogen and oxygen using electricity (electrolysis). To be genuinely “green,” this electricity must come from low-emissions sources such as wind and solar — not from burning woody biomass.

Fuel synthesis

Hydrogen is combined with captured carbon dioxide (CO₂) to produce fuels such as e-methanol. CO₂ is commonly sourced from industrial emissions. To avoid fossil fuel sources, proponents of e-fuels primarily identify emissions from pulp and paper mills, which - despite their large-scale use of woody biomass feedstocks and the resulting impacts on forests and communities - are falsely claimed to be an environmentally sustainable source. Some developers claim that Direct Air Capture (DAC) will be used in future — but DAC remains technologically and economically unproven at scale.

The Same Flawed Assumptions

Wood-based e-fuels rely on the same false premises that underpin industrial biomass energy and the pulp and paper industry:

- That carbon from trees is “neutral”
- That forest regrowth cancels out emissions
- That residues and waste are impact-free
- That expanding biomass supply will not harm ecosystems

We already know these claims do not withstand scrutiny.

Burning wood releases carbon immediately. Residues and waste frequently comprise the majority of logged material and are not small amounts of leftovers. Forest regrowth, if it occurs, takes decades — time we do not have in a climate emergency.

When e-fuels are burned, the captured carbon goes straight back into the atmosphere.

This is combustion, not decarbonisation.

Two Major Areas of Impact

1. Supply Impacts: Forests and Communities

Scaling up e-fuel production using woody biomass would require vast volumes of wood from natural forests and plantations.

This would:

- Entrench, intensify, and expand industrial logging.
- Drive expansion of plantations, including “energy plantations”.
- Increase pressure on biodiversity and forest ecosystems.
- Deplete forest carbon stocks.
- Degrade water systems and soils.
- Harm forest-dependent communities.

These impacts mirror those already documented in large-scale biomass energy and pulp and paper production. E-fuels risk locking in further expansion of this destructive model.

2. Consumption Impacts: Carbon Emissions Still Released

If woody biomass is used either as the **energy source** or as the **carbon source** to create e-fuels, the emissions are at least as large as fossil alternatives. E-methanol and e-diesel emit CO₂ at the point of combustion — just like fossil fuels.

The atmosphere does not distinguish between carbon from fossil fuels and carbon from trees.

The supposed “carbon neutrality” of burning woody biomass relies on flawed logic that ignores forest carbon loss and long tree regrowth timelines: emissions occur immediately and add to global warming, while any regrowth takes decades — if it happens at all. In climate terms, these fuels are not a genuine solution.

A Risk of Lock In

E-fuels are being positioned as a pragmatic transition solution, especially for aviation and shipping. Some environmental campaigners may support them in good faith, seeing them as preferable to oil.

But there is a serious danger:

- E-fuels promote a business as usual approach to transport at a time when we need to reduce resource extraction and our levels of consumption.
- E-fuels delay necessary electrification.
- They entrench combustion infrastructure.
- They lock in forest extraction.
- They divert renewable electricity away from direct electrification, which is far more energy-efficient.

The priority must be:

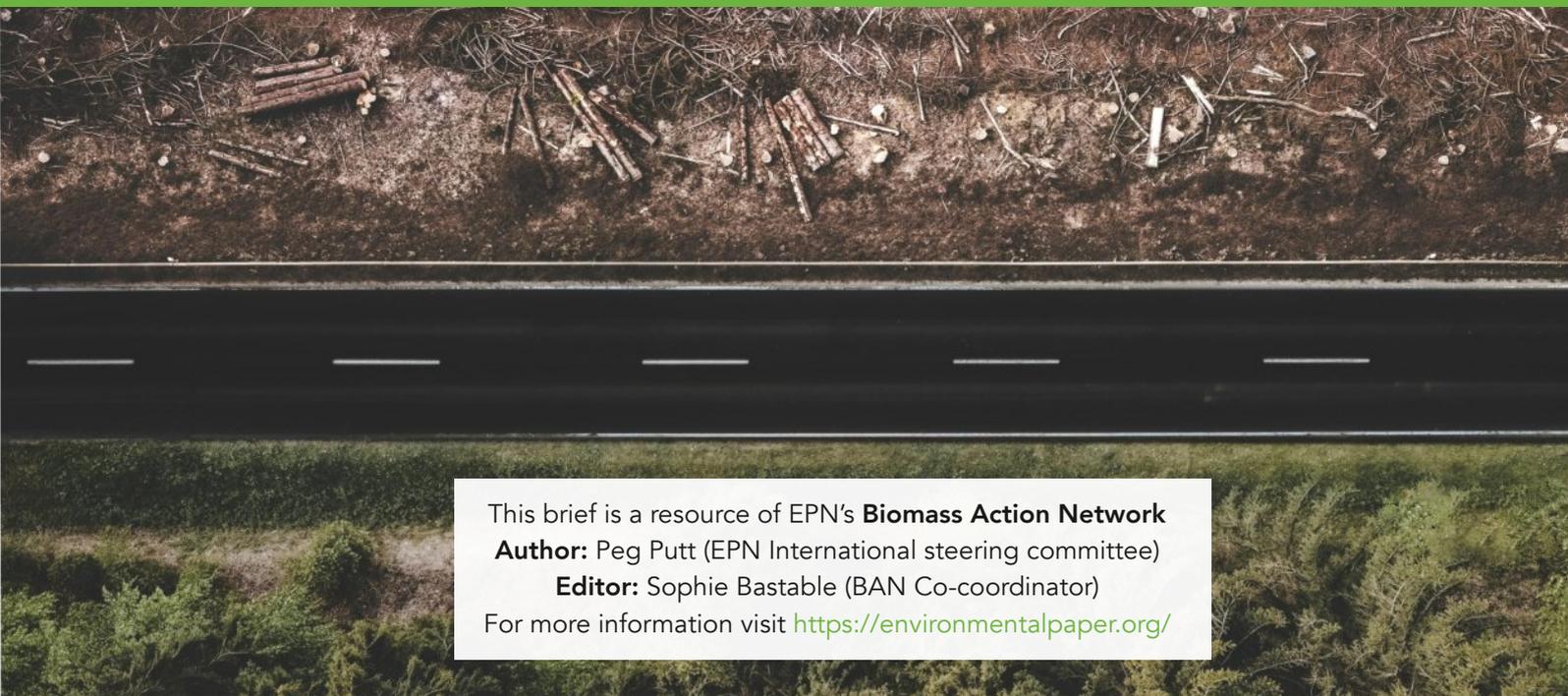
- Rapid electrification in an environmentally and socially responsible manner.
- Demand reduction in aviation and shipping.
- Protection and restoration of forests as carbon sinks — not fuel sources.
- Recognition that using large volumes of woody biomass is unacceptable.

Key Take Away

E-fuels made with woody biomass are not a clean transition fuel. They replicate the harms of industrial bioenergy while prolonging combustion-based transport systems.

Forests must remain carbon stores — not feedstock for the next generation of liquid fuels.

We cannot afford decades more reliance on the false solution that is biomass energy — rebranded for transport.



This brief is a resource of EPN's **Biomass Action Network**
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