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https://www.theguardian.com/environment/2017/dec/14/eu-must-not-burn-the-worlds-forests-for-renewable-energy

J. Beddington, S. Berry, K. Caldeira, W. Cramer, F. Creutzig, D. Kammen, E. Lambin, S. Levin, W. Lucht, G. Mace, W. Moomaw, P. Raven, T. Searchinger, N. C. Stenseth, J. P. van Ypersele (2017)
"EU must not burn the world's forests for 'renewable' energy" *The Guardian*.

A flaw in Europe's clean energy plan allows fuel from felled trees to qualify as renewable energy when in fact this would accelerate climate change and devastate forests

The European Union is moving to enact a directive to double Europe's current renewable energy by 2030. This is admirable, but a critical flaw in the present version would accelerate climate change, allowing countries, power plants and factories to claim that cutting down trees and burning them for energy fully qualifies as renewable energy.

Even a small part of Europe's energy requires a large quantity of trees and to avoid profound harm to the climate and forests worldwide the European council and parliament must fix this flaw.

European producers of wood products have for decades generated electricity and heat as beneficial by-products, using wood wastes and limited forest residues. Most of this material would decompose and release carbon dioxide in a few years anyway, so using them to displace fossil fuels can reduce the carbon dioxide added to the atmosphere in a few years too.

Unfortunately, the directive moving through parliament would go beyond wastes and residues and credit countries and companies for cutting down additional trees simply to burn them for energy. To do so has fundamentally different consequences because the carbon released into the air would otherwise stay locked up in forests.

The reasoning seems to be that so long as forests re-grow, they will eventually reabsorb the carbon released. Yet even then, the net effect – as many studies have shown – will typically be to increase global warming for decades to centuries, even when wood replaces coal, oil or natural gas.

The reasons begin with the inherent inefficiencies in harvesting wood. Typically, around one third or more of each tree is contained in roots and small branches that are properly left in the forest to protect soils, and most of which decompose, emitting carbon. The wood that is burned releases even more carbon than coal per unit of energy generated, and burns at a lower temperature, producing less electricity – turning wood into compressed pellets increases efficiency but uses energy and creates large additional emissions.
A power plant burning wood chips will typically emit one and a half times the carbon dioxide of a plant burning coal and at least three times the carbon dioxide emitted by a power plant burning natural gas.

Although regrowing trees absorb carbon, trees grow slowly, and for some years a regrowing forest absorbs less carbon than if the forest were left unharvested.
Eventually, the new forest grows faster and the carbon it absorbs, plus the reduction in fossil fuels, can pay back the "carbon debt", but that takes decades to centuries, depending on the forest type and use. We conservatively estimate that using deliberately harvested wood instead of fossil fuels will release at least twice as much carbon dioxide to the air by 2050 per kilowatt hour. Doing so turns a potential reduction in emissions from solar or wind into a large increase. Time matters. Placing an additional carbon load in the atmosphere for decades means permanent damage due to more rapid melting of permafrost and glaciers, and more packing of heat and acidity into the world's oceans. At a critical moment when countries need to be "buying time" against climate change, this approach amounts to selling the world's limited time to combat climate change under mistaken claims of improvement.

The effect on the world's forests, carbon and biodiversity is likely to be large because even though Europe is a large producer of wood, its harvest could only supply about 6% of its primary energy. For more than a decade, the increased use of biomass has been supplying roughly half of Europe's increase in renewable energy. To supply even one third of the additional renewable energy likely required by 2030, Europe would need to burn an amount of wood greater than its total harvest today. This would turn a likely 6% decrease in energy emissions by 2050 under the directive through solar and wind into at least a 6% increase. Europe's own demand for wood would degrade forests around the world, but if other countries follow Europe's example, the impacts would be even more dangerous. Instead of encouraging Indonesia and Brazil to preserve their tropical forests – Europe's present position – the message of this directive is "cut your forests so long as someone burns them for energy". Once countries are invested in such efforts, fixing the error may become impossible. To supply just an additional 3% of global energy with wood, the world needs to double its commercial wood harvests at great costs to carbon and wildlife.

Neither a requirement that forests be managed sustainably nor any other "safeguards" in the

various working drafts would stop this. For example, the directive would ban wood if harvests undermined "the long-term productivity capacity of the forest". Although that sounds good, preserving the capacity of trees to grow back still leaves more carbon in the air for at least decades. Restricting wood harvests to countries with net growing forests – another idea – would still take carbon that forests would otherwise add to their storage and instead put it in the air without meaningful global limits.

The solution is to restrict eligible forest biomass to its traditional sources of residues and waste. Legislators will likely be able to vote on such an amendment in the parliament's plenary.
By 1850, the use of wood for bioenergy helped drive the near deforestation of western Europe even at a time when Europeans consumed relatively little energy. Although coal helped to save the forests of Europe, the solution is not to go back to burning forests. As scientists, we collectively have played key roles in the IPCC, in advising European governments, and in forest and climate research. We encourage European legislators and other policymakers to amend the present directive because the fate of much of the world's forests is literally at stake.

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For more on Professor Kammen and the Renewable and Appropriate Energy Laboratory's work on biomass, **click here** and search 'biomass'