

Letter Regarding Japanese Policies for Using Wood for Bioenergy

(March 14, 2020)

To the Ministry of Energy, Trade and Industry,

We, the undersigned scientists, submit this comment on policies being considered by Japan to encourage the use of wood for electric power production. Those policies would in various ways subsidize this use of wood for power production and other bioenergy. We urge you not to provide incentives to burn wood, other than from true wood wastes and residues. There is overwhelming scientific evidence that cutting down trees to burn them for power will increase carbon in the atmosphere for decades to centuries.

Historically, producers of paper and timber products have generated electricity and heat as beneficial by-products using wood wastes and limited forest residues. What makes wood a true waste or a residue is that it would: (a) not be used for any other purpose, and (b) be the by-product of wood harvested for wood product use other than energy. In other words, this is wood that would be killed and left to decompose. Even true wood residues, consisting of slash wood otherwise left in the forest, should not be viewed as carbon neutral: Because they would decompose only over years, their immediate burning for energy will still increase warming for some years. Yet because these waste materials would decompose and release carbon dioxide within a reasonable period, using them to displace fossil fuels can often be justified for reducing net carbon dioxide emissions to the atmosphere in a reasonable period.

By contrast, deliberately cutting down trees for bioenergy releases carbon that would otherwise stay locked up in forests. Similarly, diverting wood or the portion of trees otherwise used for any kind of wood products will cause more cutting elsewhere to replace the wood. Even if forests are allowed to regrow, using wood deliberately harvested for burning will increase carbon in the atmosphere and warming for decades to centuries – as many studies have shown – even when wood replaces coal, oil or natural gas.

The reasons are fundamental and occur regardless of whether forest management is “sustainable.” To start, harvesting wood has inefficiencies. For every ton of carbon in live trees, generally at least a third and often more is left to decompose if only to protect soils, including roots and small branches. The decomposition of this wood emits carbon without replacing fossil fuels. When wood is left to dry, it loses carbon. Before wood is transported to power plants, it is now typically converted locally into wood pellets, during which much of the wood is lost. And when wood is burned in power plants, both because of its lower burning temperature and its high carbon content, it produces far more carbon than burning fossil fuels for each kilowatt hour of electricity produced. The result is a large carbon debt, with emissions often three-times or more those of burning fossil fuels.

If trees are allowed to regrow, the combination of these re-growing trees and the displacement of fossil fuels will after many years pay off the carbon debt on the wood harvested and used in the first year of a wood-burning power plant. But even then, wood harvested in subsequent

years will still have “carbon debt.” It takes more years of regrowth to pay off their carbon debts and reach a point of “parity” with fossil fuels, which means that the use of wood will not have increased carbon in the atmosphere but not have decreased it either. Even after that period, which is usually decades to centuries, many more years are required before there are significant net reductions in emissions overall.

Time matters. Placing an additional carbon load in the atmosphere for decades means permanent damages due to more rapid melting of glaciers and thawing of permafrost, and more packing of heat and acidity into the world’s oceans. Under the Paris Agreement, the goal is to have net zero emissions by 2050. Strategies that actually increase warming in that time should not be viewed as benefiting the climate, let alone treated as carbon neutral.

The climate consequences are even worse when the burning of wood for power is used as a substitute for other renewable energy measures, such as wind and solar, that actually do greatly reduce emissions and can be close to carbon neutral. In that case, the use of wood both increases emissions compared to fossil fuels and fails to achieve the reductions that would occur if these other energies sources were used.

The adverse implications are large not just for carbon but for global forests and biodiversity. Both the harvest and burning of wood, while serving many human values, have a variety of harsh environmental consequences. Yet producing just an additional 2% of global energy supplies from wood while still meeting other existing wood demands would require a doubling of commercial wood harvests globally.

The scientific basis for this letter can be found, among other scientific publications, in [“Europe’s renewable energy directive poised to harm global forests,”](#) *Nature Communications* 9:3741 (2018), as well as in other publications. This paper provides references for many of the analyses of different forests using different harvesting strategies that all find that harvesting wood for energy increases emissions for decades to centuries. The analysis we summarize here was also presented by 796 scientists in a letter to the European Parliament, which we attach. These same views were also recently [expressed](#) by the European Academies Science Advisory Council (EASAC), an organization that brings together the national academies of sciences of nearly all European countries, and these views were clearly expressed in an opinion on [bioenergy](#) accounting by the Science Committee of the European Environment Agency.

These sources emphasize that “sustainable” forest management does not change these findings. In fact, the assumption that harvesting wood for bioenergy will not increase emissions after decades to centuries assumes sustainable forest management. Sustainable management makes wood harvest renewable but now low carbon. For this reason, imposing conditions on forest management practices will not make the use of wood better for the climate than we have presented here.

In fact, a common error is the belief that harvesting wood is carbon neutral so long as the wood comes from a forest that is not declining and is therefore maintaining its carbon stock overall. In other words, the belief is that it is acceptable to harvest wood up to a forest’s incremental

forest growth. But as stated in the *Nature Communications* article cited above, “[B]y definition, this incremental growth would otherwise add biomass, and therefore carbon storage to the forest, holding down climate change. This carbon sink, in large part due to climate change itself, is already factored into climate projections and is not disposable. Harvesting and burning this biomass reduces the sink and adds carbon to the air just like burning any other carbon fuel.”

Based on this scientific evidence, we strongly discourage Japan from subsidizing in any way the use of wood other than true wastes and residues for bioenergy, and particularly in power plants. In addition, the smokestack emissions from burning wood harvested for bioenergy use should be counted in any law that counts greenhouse gases or in other ways is designed to those gases.

Sincerely,

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