Briefing on the JRC study "The use of woody biomass for energy production in the EU"

May, 2021

In January 2021, the European Commission's Joint Research Centre (JRC) published an important study on the impacts of burning wood for energy in Europe. The report was commissioned as an output of the EU's Biodiversity Strategy and aims to guide the possible revision of bioenergy policy, specifically the utilization of forest biomass in the Renewable Energy Directive (RED II). While the report contains a great deal of useful information, much of it is kept out of view, and the report's executive summary has been articulated in ways that attempt to defuse the gravity of some of the findings. Below, we identify some of the report's key findings and highlight some of its shortcomings. An annotated version of the report is available, which develops some of these critiques further.[1]

The JRC study's approach

The study examined the sources and uses of wood and wood-derived biomass burned in the EU, focusing on both primary biomass (wood sourced directly from forests, equating to "forest biomass" using the terminology of the RED II) and secondary biomass (wood and wood-derived fuels derived from processes, such as sawdust from sawmills and black liquor from paper-making, including post-consumer wood). The study especially examined the climate and ecosystem impacts of primary biomass, assessing 24 scenarios as shown in Figure 1 below.

Important findings

The role of biomass in the EU

The report assessed the state of the biomass market in 2015 – 2016 and did not report on any increase in biomass use (including imported wood pellets) since then. Extrapolating from numbers in the report, it appears that forest biomass provided about 18% of renewable energy during the period and about 3% of the EU's overall energy. Of all primary biomass, the report estimates that 47% is "stemwood," and 53% is branches and tops.[2; prev. version of briefing incorrectly flipped these #'s]

About 14% of wood used for energy is of unknown origin, which the report concludes is most likely sourced directly from forests. Given that a large share of the wood is from unknown sources, some of the products are likely from illegal logging. The report concludes that "Such data gaps represent a major obstacle to the effective governance of wood-based bioenergy policies, because without reliably knowing how much and what type of forest biomass is used for bioenergy, **no effective policy can be implemented"** (emphasis added).

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[1] At https://forestdefenders.eu/wp-content/uploads/2021/01/JRC-biomass-report-markup.pdf

[2] The report states that renewable energy provided 17% of gross final energy consumption in the EU, with bioenergy constituting 59.2% of all renewable sources. Ignoring biomass imports from outside the EU, which at that time provided less than 5% of biomass burned in the EU, it concludes that 60% of EU domestic biomass is wood-based. Of total wood used for energy, the report concludes that at least 37% is of primary origin, meaning sourced directly from forests. A further 14% of wood used for energy is of unknown origin, though the report states that it is most likely also sourced directly from forests. Adding this to the amount of wood biomass known to be sourced from forests would mean 51% of wood burned for energy comes directly from forests. Using this figure and multiplying through, it appears that forest biomass was providing around 18% of renewable energy in 2015-2016, and about 3% of the EU's energy overall. Of all primary biomass, the report estimates that 47% is "stemwood," and 53% is branches and tops.

Climate and ecosystem impacts

The report acknowledges that burning biomass in the EU emitted 350 – 380 million tonnes of CO_2 in 2015. It states that due to the differing net carbon impact of various types of biomass, and how the real sources and types of wood burned are to a great degree unknown**, it is impossible to conclude that biomass is providing a climate benefit**. This is a severe understatement given that the report elsewhere acknowledges the large net carbon emissions from burning stemwood and forest residues. The report affirms that biomass is not carbon neutral but justifies its classification as having "zero" emissions because carbon impacts are ostensibly counted in the land sector. However, the report makes an interesting and significant suggestion that it may be time to abandon "baseline" accounting in the land sector, and assess forest carbon gains and losses more transparently against a historical benchmark, as is done for other emissions reporting.

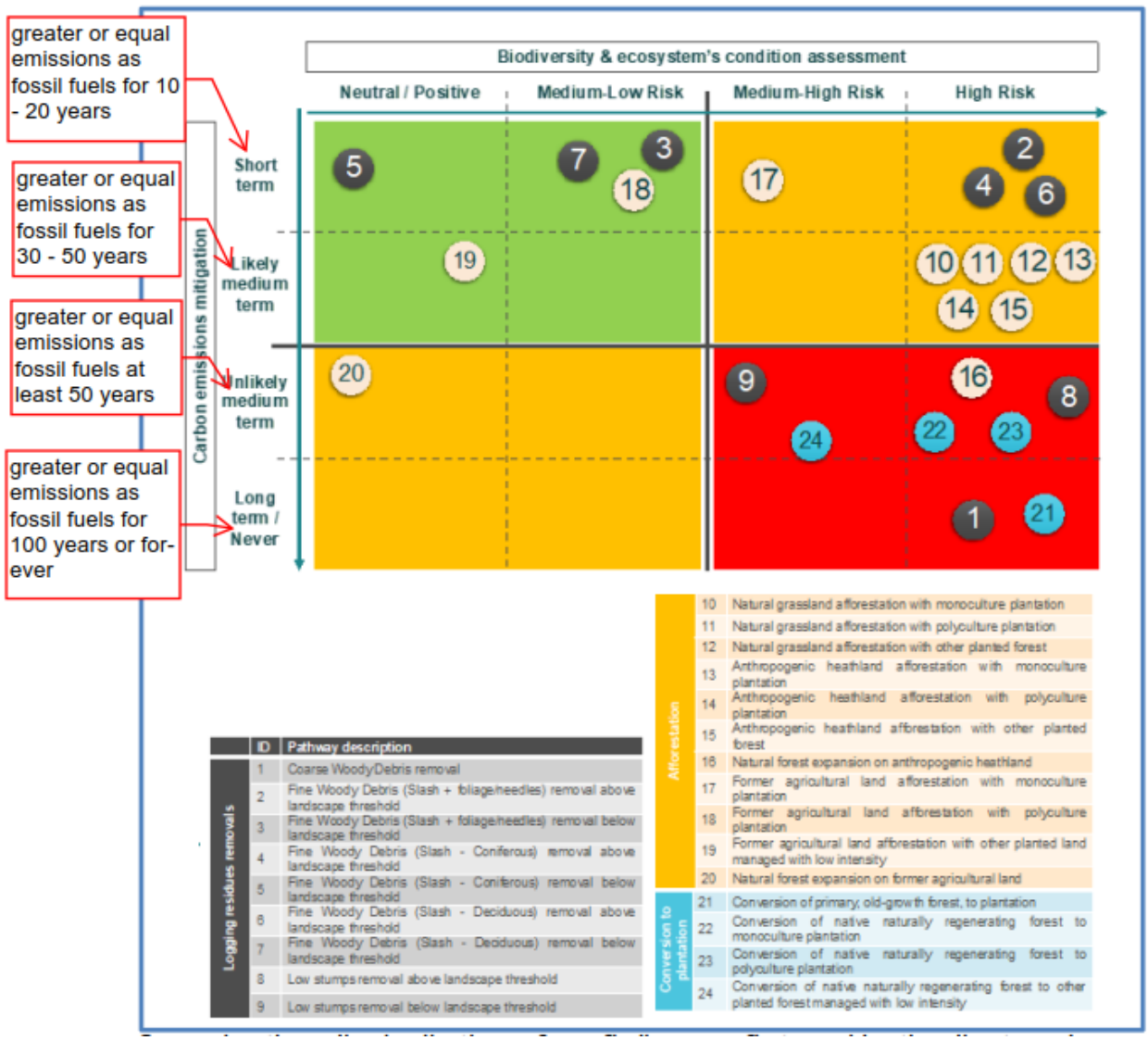

Figure 1. Overview of climate and ecosystem impact risk of 24 forest biomass scenarios assessed by the JRC (annotations in red boxes added for clarity).

The report assessed 24 forest biomass pathways with regard to potential carbon payback times and their risk to biodiversity and ecosystem function. Figure 1 reproduces the key graphic that summarizes risks to emissions and ecosystem function (the figure is annotated to include the

timeframes for climate impacts as defined in the study). Importantly, the report defines "carbon payback" not as "carbon neutrality" but instead as the amount of time required for bioenergy scenarios to achieve emissions *parity* with fossil fuels; prior to this point, emissions from burning biomass *exceed* emissions from burning fossil fuels.

The scenarios explore three main pathways for fuel provision: use of forestry residues, afforestation of previously unforested lands, and conversion of forests to plantations.

A key oddity of the report, however, is that while it assessed scenarios where biomass is derived from harvesting forestry residues and afforestation, it did not include scenarios where stemwood is harvested, despite acknowledging that stemwood constitutes almost half of the primary wood used for energy. The scenarios also fail to include salvage logging, which according to the report provides a significant proportion of the forest wood burned for energy in the EU. The report cites previous work finding that the carbon impacts of harvesting stemwood generally exceed those from fossil fuels for decades to centuries.

Of the scenarios assessed, the report finds only one achieves emission savings compared to fossil fuels in the "short term" (i.e. within one or two decades) while posing a low risk to biodiversity: pathway 5, the burning of "fine woody debris" (twigs and very low-diameter branches), providing enough material is left onsite to maintain soil carbon, fertility, etc. All the other 23 scenarios either lead to no carbon savings in less than two decades, or pose a risk to biodiversity, or both. The report itself identifies clear "lose-lose" situations as those "whereby the pathway would damage forest ecosystems without providing carbon emission reductions in policy-relevant timeframes…. Lose-lose pathways include removal of coarse woody debris, removal of low stumps, and conversion of primary or natural forests into plantations." Considering that most forest wood burned for energy is either stemwood or large diameter forest residue, **this means that the JRC has itself identified the majority of forest biomass burned in the EU as a "lose-lose" outcome for climate and biodiversity.**

Inconsistencies

The JRC report contains inconsistencies in many areas, and its recommendations are often weak. For instance, although the report concludes that most current bioenergy pathways are detrimental to climate and biodiversity, it alleges that many of the impacts could be minimized through the "swift and robust implementation of the REDII sustainability criteria." In fact, none of the forest biomass criteria would do anything to prevent the kind of damaging harvesting that the report describes.[3]

Conclusion

Despite its inconsistencies and weak recommendations, the JRC report's key findings show clearly why burning forest biomass for energy is a lose-lose situation for the climate and biodiversity. It is now up to the EU Commission to design appropriate policy conclusions and exclude forest biomass as a source of "renewable energy" under the RED framework, hence ending subsidies and other incentives for forest biomass in EU member states.

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[3] Booth, Mary S, and Ben Mitchell. 2020. Paper Tiger: Why the RED II biomass sustainability criteria fail forests and the climate. Pelham, MA: Partnership for Policy Integrity. http://eubiomasscase.org/wp-content/uploads/2020/07/RED-II-biomass-Paper-Tiger-July-6-2020.pdf.