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Thank you for the opportunity to comment on the Assessment Framework for Biogenic Carbon Dioxide Emissions from Stationary Sources prepared by the SAB of EPA. Having participated in past SAB reports, I understand the challenges in their preparation, and wish to offer some constructive comments.

The increase in forest biomass for electric power generation is growing in the United States and in the European Union because of the assumption that it is a low carbon, renewable substitute for fossil fuels. This shift in fuel is encouraged by the fact that many states (other than Massachusetts) count woody biomass as carbon neutral. The United Kingdom counts as zero carbon, emissions from wood pellets sourced by clear cutting lands in the United States and burned as a replacement for coal as carbon neutral and heavily subsidizes their use. An amendment requiring all federal agencies including EPA to count all forest bioenergy as carbon neutral was recently incorporated into energy legislation by the U.S. Senate.

Recent research makes clear that carbon stocks need to be maintained and increased through restoration of degraded and previously cleared forests and soils if there is to be any possibility of preventing global average temperatures from rising above 2 degrees C and persisting for centuries to come. Unfortunately, the Framework as it currently structured would exacerbate future warming, and cause a number of irreversible changes.

The Framework analysis does not conform to what is actually happening in the use of bioenergy in stationary sources today. It assumes that emissions today that are removed far into the future are the same as emissions avoided today. The Assessment concludes that all that matters is that the uptake of atmospheric carbon dioxide after 100 years of regrowth erases the consequence of the original emissions. A 100-year time frame largely ignores any warming from another biogenic greenhouse gas, methane.

There are several problems with this analysis.

First, taking credit for removals at the time of carbon dioxide emission from combustion does not conform with national and international policies. The Clean Power Plan and the Paris Climate Agreement have set specific dates such as 2030 and 2050 for specific, quantified emission reductions. The US actually has planned to use pre-2005 US forest sink trajectories to help meet its 2020 goal. This proposal puts that goal at risk by taking credit for actions that would in fact increase warming during this period. Also the UNFCCC requires that emissions for bioenergy be counted under land use changes or must be noted as energy based emissions. Today, they are being counted under neither.

Second, the analysis references pulse models for its analysis when continuous cutting and burning of forest bioenergy, and concludes that it is only the net after a 100-year time frame that matters. The extra CO₂ in the atmosphere while trees are growing traps heat and many irreversible changes occur: sea ice, ice sheets and glaciers melt and do not

refreeze, sea level rises and does not retreat, ocean acidification occurs and is not neutralized by restoring the atmosphere, soil carbon is lost at the time of harvest and only very slowly rebuilt. The climate consequences of black carbon are not addressed by a simple carbon balance, nor are the irreversible feedback emissions of methane and carbon dioxide released from thawing permafrost associated with the radiative forcing from the biogenic carbon dioxide released during combustion*.

Third, the assessment treats combustion and replacement growth as equally certain. We are certain that emissions occur at the time of combustion, but there are many uncertainties that a replacement forest will regrow because of drought, fire, insects, disease or land use change. Also, a large fraction of forestland is owned privately, often in small fragmented plots without sustainable forest management practices that are difficult to monitor and verify.

Finally, the Assessment does not provide the requested spatial and production scale for determining Biogenic Assessment Factors (BAFs). The inefficiency of using solar energy to produce wood and then burn it to produce electricity requires vast amounts of forests to be dedicated to power plant fuel to provide a very small amount of electricity. Using data provided by EIA suggests that for each 1% increase in U.S. electricity production would require cutting and burning an additional 17% of current forest production. To put it in perspective, commercially available solar panels produce 80 times the electricity as a wood pellet power plant utilizing the same amount of solar energy while producing zero carbon dioxide emissions.

I urge the panel to reexamine the current draft, and expand the membership to include more forest ecologists/carbon cycle/climate expertise, and to refer to additional fields including the literature on the social cost of carbon as is done for other regulatory purposes. The use of discount rates in evaluating future CO₂ removal is part of the SCC analysis.

Probably the most direct way to evaluate the temporal aspect of bioenergy is to count emissions in the year in which they occur, and any future offsets by forest regrowth annually in the years in which they actually remove carbon dioxide from the atmosphere. This simple approach most closely approximates the bioenergy carbon cycle. There may be a few circumstances where bioenergy is an option, but it must be accounted for appropriately in terms of the full Biogenic Assessment Factors.

Thank you.

*In response to a question asked by a panel member, the amount of carbon dioxide released per unit of electricity produced by burning wood is much higher than when coal is used. This is a result of the basic chemistry of combustion, which produces slightly more carbon dioxide from wood than coal and the much lower efficiency of converting that heat into electricity because of the lower combustion temperatures of wood firing. If one were to “offset” coal fired electricity emissions by planting trees, fewer would need to be planted if coal were used rather than wood.