

May 17, 2010

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Dear Speaker Pelosi and Majority Leader Senator Reid,

We write to bring to your attention the importance of accurately accounting for carbon dioxide emissions from bioenergy in any law or regulation designed to reduce greenhouse gas emissions from energy use. Proper accounting can enable bioenergy to contribute to greenhouse gas reductions; improper accounting can lead to increases in greenhouse gas emissions both domestically and internationally.

Replacement of fossil fuels with bioenergy does not directly stop carbon dioxide emissions from tailpipes or smokestacks. Although fossil fuel emissions are reduced or eliminated, the combustion of biomass replaces fossil emissions with its own emissions (which may even be higher per unit of energy because of the lower energy to carbon ratio of biomass). Bioenergy can reduce atmospheric carbon dioxide if land and plants are managed to take up additional carbon dioxide beyond what they would absorb without bioenergy. Alternatively, bioenergy can use some vegetative residues that would otherwise decompose and release carbon to the atmosphere rapidly. Whether land and plants sequester additional carbon to offset emissions from burning the biomass depends on changes both in the rates of plant growth and in the carbon storage in plants and soils. For example, planting fast-growing energy crops on otherwise unproductive land leads to additional carbon absorption by plants that offsets emissions from their use for energy without displacing carbon storage in plants and soils. On the other hand, clearing or cutting forests for energy, either to burn trees directly in power plants or to replace forests with bioenergy crops, has the net effect of releasing otherwise sequestered carbon into the atmosphere, just like the extraction and burning of fossil fuels. That creates a carbon debt, may reduce ongoing carbon uptake by the forest, and as a result may increase net greenhouse gas emissions for an extended time period and thereby undercut greenhouse gas reductions needed over the next several decades¹.

Many international treaties and domestic laws and bills account for bioenergy incorrectly by treating all bioenergy as causing a 100% reduction in emissions regardless of the source of the biomass. They perpetuate this error by exempting carbon dioxide from bioenergy from national emissions limits or from domestic requirements to hold allowances for energy emissions. Most renewable energy standards for electric utilities have the same effect because bioenergy is viewed as a renewable energy even when the biomass does not eliminate or even reduce greenhouse gas emissions. This general approach

¹ J. Fargione, J. Hill, Tilman D., Polasky S., Hawthorne P (2008), Land Clearing and the Biofuel Carbon Debt, *Science* 319:1235-1238

appears to be based on a misunderstanding of IPCC guidance². Under some scenarios, this approach could eliminate most of the expected greenhouse gas reductions during the next several decades.

U.S. laws will also influence world treatment of bioenergy. A number of studies in distinguished journals have estimated that globally improper accounting of bioenergy could lead to large-scale clearing of the world's forests³.

The lesson is that any legal measure to reduce greenhouse gas emissions must include a system to differentiate emissions from bioenergy based on the source of the biomass. The National Academy of Sciences has estimated significant potential energy production from the right sources of biomass⁴. Proper accounting will provide incentives for these sources of bioenergy.

Sincerely,

² T.D. Searchinger, S.P. Hamburg, J. Melillo, W. Chameides, P. Havlik, D.M. Kammen, G.E. Likens, R. N. Lubowski, M. Obersteiner, M. Oppenheimer, G. P. Robertson, W.H. Schlesinger, G.D. Tilman (2009), Fixing a Critical Climate Accounting Error, *Science* 326:527-528

³ E.g., J.M. Melillo, J.M. Reilly, D.W. Kicklighter, A.C. Gurgel, T.W. Cronin, S. Patsev, B.S. Felzer, X. Wang, C.A. Schlosser (2009), Indirect Emissions from Biofuels: How Important?, *Science* 326:1397-1399; Marshall Wise, Katherine Calvin, Allison Thomson, Leon Clarke, Benjamin Bond-Lamberty, Ronald Sands, Steven J. Smith, Anthony Janetos, James Edmonds (2009), Implications of Limiting CO₂ Concentrations for Land Use and Energy, *Science* 324:1183-1186

⁴ National Research Council (2009), *Liquid Transportation Fuels from Coal and Biomass: Technological Status, Costs, and Environmental Impacts* (National Academy of Sciences, Washington, D.C.)

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