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Crunching the numbers on bioenergy rules

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November 23, 2009

ALTHOUGH THE very term “accounting rules” may cause most people to turn the page, the financial crisis has shown that when rules allow businesses to claim profits from what are actually losses, they distort economic incentives at our peril. The importance of sound accounting rules applies equally to how we count emissions of carbon dioxide as part of any law to reduce global warming. Governments should fix a worrisome error in these carbon accounting rules and thereby provide proper incentives for a vibrant bioenergy industry that helps reduce global warming.

The problem: treaties and laws now treat all forms of bioenergy as carbon neutral and therefore completely non-polluting. In reality, how much bioenergy reduces greenhouse gases depends on the source of the plant material. The right rules will encourage the development of fast-growing grasses and trees that can greatly increase the amount of carbon absorbed by plants on marginal land and thereby reduce global warming. The wrong rules will encourage clearing of forests, which releases carbon dioxide and may even increase greenhouse gases while also threatening biodiversity.

Although bioenergy does not significantly change the carbon dioxide released by tailpipes and smokestacks, bioenergy can offset these releases by stimulating higher rates of plant growth, which absorb carbon dioxide from the atmosphere in a recycling effect. The use of fast-growing plants on abandoned and degraded farmland provides a great opportunity because they can not only generate additional biomass for energy but simultaneously restore carbon to the soils. Such areas could produce most of the world’s biofuels. Using abundant residues left after timber or crop harvests also provides additional carbon to replace fossil fuels in ways that reduce carbon dioxide because this biomass would otherwise decompose rapidly and release its carbon to the air anyway.

Some biofuel production processes create not just energy but a “biochar.” Native Amazonians showed this form of charcoal from heated biomass can store carbon stably in soils for centuries. Counting this way of sequestering carbon, some biofuels may reduce greenhouse gases by more than 100 percent, and therefore provide a safer alternative to “bioengineering” as a way of reversing atmospheric warming.

Yet the earth's plants and soils store three times as much carbon as the atmosphere holds today, and if bioenergy uses or displaces this carbon it too adds carbon to the air. Some ways of thinning forests may stimulate faster tree growth that rapidly replaces the lost wood (and lost carbon), but broader clear cuts to make wood chips for electricity will generally reduce forest carbon stocks for decades, which reduces or eliminates the benefits of displacing coal. If forests are cleared to plant bioenergy crops, the release of carbon may increase greenhouse gases on a net basis for long periods. And while growing crops for fuel on good cropland absorbs carbon, doing so does not necessarily generate a 100 percent gain because it comes at the expense of not growing plants and absorbing carbon in the form of food. The extent to which this process generates carbon savings depends on how that food is replaced.

Because of these very different consequences, treaties and laws that place limits on carbon dioxide need to distinguish bioenergy by its source and production process. Following a misguided accounting convention, treaties and laws now treat all forms of bioenergy as though they generate no pollution, and the climate bill working its way through Congress shares this error.

If the error continues globally, it gives oil firms or electric utilities that must reduce their greenhouse gas emissions a false incentive to switch to those forms of bioenergy that result from clearing forests. Several studies predict they will do so on a large scale. By contrast, the right accounting will give entrepreneurs the incentive to commercialize the great technical innovations in generating more carbon from the earth's land and converting it efficiently into useable fuel.

The challenge of reducing global warming requires that we vigorously pursue these promising opportunities, and getting the accounting right is a necessary part of that effort.

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