October 14th, 2009

The Honorable Lisa Jackson,
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Ave.
Washington, D.C.

Dear Administrator Jackson,

On behalf of our organization members, we are writing to express concern about the potential inclusion of biochar in U.S. agriculture and climate policies. Biochar is essentially charcoal, made by pyrolyzing plant biomass. This results in both "syngas" which can be further refined for energy use, and the residue, biochar. It is promoted as a means of sequestering carbon in soils and increasing soil fertility among other claimed benefits.

However, there is little basis for confidence in these claims, and international and national level supports for biochar are dangerously premature. Large scale implementation of biochar has the potential to worsen global warming, exacerbate biodiversity loss by mandating increased use of synthetic fertilizers, and introduce health risks associated with inhalation of particles.

The United Nations Environment Programme states the following: "*Biochar is a new and poorly understood technology. Research is still at a preliminary stage and large-scale biochar deployment is inadvisable until these uncertainties are resolved... The impacts of large-scale biochar production on biodiversity and long-term agricultural sustainability (e.g. nutrient depletion) are unknown.*[i]

You may be aware that, at the international level, there has been a strong push for incorporating biochar into a Copenhagen agreement and into the Clean Development Mechanism funding. This has been initiated and pursued by the International Biochar Initiative (IBI), a lobby group which involves members of startup biochar companies, consultants and academics, several of them with industry links. This outcome is still possible, although a final decision may not be made until 2010 or later.

The head of the IBI, Johannes Lehmann recently testified (in capacity as a scientist) to the Select Committee on Energy Independence and Global Warming, an indication that biochar is being evaluated at federal level within the U.S.. Secretary Vilsack served as keynote speaker at the recent North American Biochar conference in Colorado, and has expressed support for the technology.

Last week, Senator Reid introduced the "Water Efficiency via Carbon Harvesting and Restoration Act". This bill would provide loans and support project development to use "excess forest fuel load" and invasive species, as feedstocks for biochar production. Biochar production on a very large scale requiring millions of acres of tree plantations is also being promoted as a technology for climate geoengineering.

Yet many concerns remain about the negative impacts of large scale biochar implementation. These are summarized below, and also detailed in a briefing that is available here;
(http://www.biofuelwatch.org.uk/docs/biocharbriefing.pdf).
Many of these are corroborated and elaborated in more technical detail in this report by Australia's CSIRO here:
(http://www.csiro.au/resources/Biochar-climate-change-and-soil.html

We strongly urge that you adopt a precautionary approach to this technology, and ensure that biochar is not included as a technology eligible for federal offsets.

To summarize our concerns:

Claims that biochar will sequester carbon over long periods of time are not founded: These claims are based on the successes of Amazon indigenous peoples who created very fertile soils enriched with charcoal, called "Terra Preta" thousands of years ago. This involved using diverse materials along with charcoal, a procedure very different from current practices. Extrapolation from Terra Preta to modern biochar is illogical and unfounded. Studies have shown that soil recently amended with charcoal has been shown to have quite different properties from Terra Preta.[ii] Soil scientist Bruno Glaser has suggested that it may take 50-100 years for interactions between soil microbes and charcoal to create soils resembling Terra Preta, if at all.[iii] Currently there are no field studies of modern biochar spanning more than a few years, and these show mixed results. It is generally accepted that up to about 20% of carbon in charcoal is rapidly lost as CO_2. [iv] Studies of the long term fate of charcoal generally (from wildfires and ancient fire pits etc) show that, while in some cases charcoal is retained over very long periods, much is lost through soil erosion, oxidation or other, currently unknown means, depending on circumstances. A recent peer reviewed study of swidden agriculture practices in Kenya revealed that 72% of the carbon was lost in the first 20-30 years.[v] Wildfires[vi] and the activity of soil microbes[vii] are also implicated in the loss of carbon from charcoal, and loss of carbon from preexisting soil organic matter following addition of biochar.[viii]

Claims that biochar increases soil fertility are misrepresented and not based on long term studies A recent field study near Manaus, Brazil (one of the few published in peer reviewed journals) found that charcoal mixed with synthetic fertilizer enhanced yields more than synthetic fertilizer alone, but the highest reported yields were obtained using solely chicken manure instead. Charcoal alone, actually suppressed plant growth completely after two harvests![ix] Other studies have shown that charcoal amendments can, in the short term, either increase or decrease plant yields, depending amongst other things on the quantities of charcoal added, soil type and crop tested.[x] There are no longer-term field studies and so it is not known whether the increased plant growth sometimes observed with the addition of charcoal would be sustained over the longer term. The much touted fertility effect of biochar is thus dangerously unfounded. In fact much of the industry and research focus is on producing fertilizer made from a combination of charcoal and synthetic nitrogen fertilizer (ammonium bicarbonate).[xi] Some studies indicate an improved uptake of fertilizer nutrients by plants in the presence of biochar, but it must be considered that the (large quantities of) biomass used to create biochar is thereafter unavailable for creation of soil humus, which does in fact provide plant nutrients, unlike biochar. This issue has been raised by Vandana Shiva.[xii] Results of studies on fertility impacts of biochar vary tremendously depending upon the type of soil, plant species, the pyrolysis process and feedstocks used for biochar production among other factors. The complexity of soil ecosystems and responses to biochar additions are poorly understood at this point, and in many cases, biochar additions could be detrimental either in short or long term.

The impacts of creating huge new demands for biomass are not acknowledged. The production of biochar results in only a portion (12-40%) of the carbon from pyrolized biomass retained in the biochar. Thus very large quantities of biomass are required. Such demands will have huge implications for land use, and must be weighed against various other competing demands (for example, current demands for biomass for liquid transportation fuels, electricity and heat, pulp and paper, food and feed production, and wood and fiber demands.) These various demands are already having enormous consequences on food production, hunger and human rights, with massive land grabs underway. A recent study reported in Science warns that a large-bioenergy scenario could result in the complete destruction of natural forests and savannahs by 2065.[xiii] Ecosystems are under ever increasing pressure, declining even as their critical roles in supporting life, regulating climate and rainfall etc are increasingly recognized. Biochar, especially on the large scale promoted by the IBI as a climate mitigation technology, requiring biochar plantations on the order of 500 million hectares minimum,[xiv] will contribute further to these pressures.

Biochar is charcoal, and the production results in releases of soot, a major contributor to global warming. Application of large quantities of charcoal darkens soil surfaces, decreasing albedo and therefore increasing warming. Particles degrade over time and likely will become airborne, subsequently landing on and darkening land surfaces distant from the point of application. Biochar particles tend to degrade to a size around 5 micrometers[xv], which is within the range of size considered most dangerous to human health when inhaled. In a recent test in Quebec, biochar was applied to a soy field. During application, the researchers reported that about 30% of the biochar dust "blew away".[xvi]

Biochar additions to soils can alter microbial communities with negative and thus far poorly understood consequences. Some microbes are capable of metabolizing black carbon (releasing CO_2) and others, encouraged by the presence of biochar, metabolize non-biochar soil organic matter (humus) also releasing CO_2.[xvii] Because biochar provides no nutrients for plant growth, using residues to produce biochar rather than adding those residues to soil as compost, can mandate the use of additional fertilizers.

Biochar must be tilled into soils. Mechanical disturbances to soils contribute to soil emissions. Biochar must be tilled into soils, and tilling contributes to the breakdown of particles, increases the likelihood of airborne black carbon, and soil disturbance results in CO_2 releases from oxidation of soil organic matter. Toxins, including carcinogenic polycyclic aromatic hydrocarbons (PAH), will be concentrated in biochar and thus risk contaminating agricultural soils.[xviii] Charcoal is associated with the lung disease, pneumoconiosis, which make handling and airborne particles potentially dangerous.[xix]

A declaration opposing the rapid advance of biochar policy supports was signed by 156 organizations worldwide, indicating widespread concern among civil society groups. Available here: http://www.regenwald.org/international/englisch/news.php?id=1226

Careful assessment of biochar is especially critical in light of the massive supports for agriculture and forestry offsetting that could become available under carbon marketing schemes within the international and US climate policies. While not specifically mentioned in the list of eligible offset technologies provided within the Peterson amendment to Waxman Markey climate bill, biochar could become eligible for such supports through a process of petitioning with one year response time frame (as currently drafted).

While the effectiveness of using agriculture and forestry offsets is subject for debate, the rapid scaling up of biochar production would clearly be premature and potentially have very negative impacts on climate and ecosystems. We therefore urge that you adopt an appropriate precautionary approach to this technology and ensure that biochar is not included among eligible offset technologies.

Thank you in advance, on behalf of the undersigned organizations.

Biofuelwatch
Caney Fork Headwaters Association
Cumberland Countians for Peace & Justice
Energy Justice Network
Environmental Alliance of North Florida
Florida League of Conservation Voters
Floridians Against Incinerators In Disguise
FoodFirst
Global Justice Ecology Project
Heartwood
HOPE (Help Our Polluted Environment)
Massachussetts Environmental Energy

Massachussetts Forest Watch
Native Forest Council
Network for Environmental & Economic Responsibility
Organic Consumers Association
Rainforest Action Network

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