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ENERGY RECOVERY COUNCIL

September 13, 2010

EPA Docket Center
Attention Docket OAR-2010-0560
Mail code 2822T
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Via e-mail to GHGBiogenic@epa.gov

Re: Call for Information: Greenhouse Gas Emissions Associated with Bioenergy and Other Biogenic Sources

To Whom It May Concern:

The Energy Recovery Council ("ERC") appreciates the opportunity to submit comments in response to the Agency's Call for Information on Greenhouse Gas Emissions Associated with Bioenergy and Other Biogenic Sources published in the Federal Register on July 15, 2010. ERC was among the private and governmental entities involved in municipal solid waste management who wrote to Administrator Jackson to express our concern with the EPA decision in the promulgation of the Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas (GHG) Tailoring Rule ("Tailoring Rule"), to regulate biogenic GHG emissions in the same manner as anthropogenic GHG emissions from fossil fuel use. In doing so the Agency made a significant shift in federal policy with little explanation for its departure from established scientific principles and lack of consideration of the negative impacts it will cause. We are encouraged that the EPA is evaluating information and considering an alternative approach to the treatment of biogenic GHG emissions.

ERC is a national trade group representing companies and communities engaged in the waste-to-energy sector. Waste-to-energy facilities generate renewable electricity using modern combustion technology equipped with state-of-the-art pollution control systems. ERC members include: Covanta Energy Corporation, Wheelabrator Technologies Inc., Babcock & Wilcox, several dozen businesses and organizations in the municipal solid waste (MSW) management and energy fields, and 28 municipalities that are served by waste-to-energy plants. Members of ERC have a vital stake in the consideration of this issue as owners and operators of facilities that use municipal solid waste, biomass and other fuels to generate renewable power.

Biomass, particularly from waste or residual sources, can make a major contribution to the U.S. renewable energy supply, thereby reducing GHG emissions associated with our fossil fuel dominated electrical generation system. According to the Energy Information

Administration, nearly 40% of the non-hydro renewable energy generation in 2009 was from biomass, including municipal solid waste. A joint report issued by The National Academy of Sciences, The National Academy of Engineering, and the National Academies estimated that sustainable biomass could represent between 7 and 19% of *all* U.S. 2007 electrical generation.

Beyond carbon neutrality, the use of waste biomass streams can actually reduce GHG emissions on a lifecycle basis, by avoiding emissions associated with traditional disposal practices, such as landfilling. Waste-to-energy facilities are a net reducer of greenhouse gas emissions relative to the traditional practice of landfilling the MSW remaining after recycling. Waste-to-energy avoids approximately 1 ton of carbon dioxide equivalents (CO_2e) for every ton of municipal solid waste (MSW) processed on a life cycle basis when using national averages.[1]

Carbon Neutrality of Biomass

Emissions of fossil fuel derived CO_2 and other anthropogenic GHGs such as methane, nitrous oxide, and HFCs are the primary drivers behind human induced climate change. In its most recent report, the IPCC observes that "global increases in CO_2 concentrations are due primarily to fossil fuel use."[2] In the United States, the combustion of fossil fuels alone represents 80% of total greenhouse gas emissions.[3]

In contrast, biomass carbon is part of the normal carbon cycle and its combustion *does not* remove carbon from permanent geological storage. When biomass, including the biogenic fraction of MSW, is used for energy, the fossil fuels displaced stay in the ground, permanently sequestered.[4] The Oak Ridge National Laboratory has found that "using current technologies, the most efficient way to convert biomass to useful energy, and thus to maximize the carbon dioxide savings, is to burn the biomass for heat or electricity generation."[5] Biomass energy and waste to energy are widely recognized as part of the solution to climate change, including by the IPCC and the World Economic Forum.[6, 7]

However, not all sources of biomass used for energy are created equal. Certain types of biomass fuels, whether used for liquid fuel production or electricity generation, can lead to increased net GHG emissions when both direct and indirect land use change are considered. For example, the widespread clear-cutting of late successional or old growth

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[1] B. Bahor, M. Van Brunt, K. Weitz, A. Szurgot, "Life Cycle Assessment of Waste Management Greenhouse Gas Emissions Using Municipal Waste Combustor Data" *J. Envir. Engrg.* **136**: 8, 749-755. http://dx.doi.org/10.1061/(ASCE)EE.1943-7870.0000189

[2] IPCC, *Climate Change 2007: Synthesis Report. Contribution of Work Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp.

[3] U.S. EPA. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2006. April 15, 2008. Washington D.C.

[4] Cushman, Janet, Gregg Marland, Bernhard Schlamadinger. Biomass Fuels, Energy, Carbon, and Global Climate Change. Oak Ridge National Laboratory Review, v28, n2.

[5] *Ibid.*

[6] IPCC (2007)

[7] World Economic Forum. *Green Investing: Towards a Clean Energy Infrastructure.* January 2009. http://www.weforum.org/pdf/climate/Green.pdf

forests and conversion to crop land or developed areas clearly results in a net increase in GHG emissions associated with land use change. To date, land use change has been a net carbon sink in the U.S. national GHG inventory; however, this could quickly change if the U.S. EPA does not recognize the land use change impacts that may result from the non-sustainable use of our biomass resources. This type of an overuse could result from an indiscriminate assumption that all biomass use is carbon neutral.

Proposed Land Use Change Accounting Methodology

For the purposes of regulation under the Clean Air Act (CAA), biogenic CO_2 emissions should be counted only to the extent they result in direct or indirect land use change. As described in the Call for Information, both an assumption that all biogenic CO_2 is carbon neutral and the converse assumption that all biogenic CO_2 is equivalent to fossil CO_2 oversimplify a complex issue. Consequently, both approaches are inappropriate for regulation of GHG emissions under the CAA.

Alternatively, we propose that biogenic CO_2 emissions from the combustion of biomass are considered under the PSD and Title V programs only to the extent that they result from indirect or direct land use change. More specifically, we recommend that the EPA maintain the long standing accounting practice of reporting biogenic carbon for informational purposes only, and evaluate the net emissions from biomass combustion based on the land use change evaluated on a 100 year basis.

Such a mechanism would be complimentary to the existing EPA practice outlined in the 2009 revisions to the Renewable Fuel Standard (RFS2). The RFS2 evaluates biofuels on a life cycle basis, including the effects of direct and indirect land use change, against a fossil fuel baseline. However, instead of comparing emissions against a fossil fuel baseline, as is done in the RFS2, we recommend that the EPA simply subject net positive emissions associated with land use change in excess of the relevant thresholds under the Tailoring Rule to permit requirements and BACT analysis as appropriate.

A key benefit of this approach is that local permit authorities will be able to issue permit requirements appropriate to local conditions. While CO_2 and other greenhouse gases are global pollutants, appropriate and sustainable forestry and agricultural practices are regionally dependant. Under this netting approach, local jurisdictions could require the permittee to implement practices, such as certification to forest sustainability standards, for those land use change emissions in excess of regulatory thresholds, thereby mitigating the impact.

In addition to being complimentary to the groundbreaking methodology in the RFS2, assessment of biogenic emissions through a land use change lens preserves the accounting structure of the U.S. National Greenhouse Gas Inventory and is consistent with the reporting mechanisms outlined in the IPCC 2006 Guidelines for National Inventories. Maintaining consistency with existing regulations is no reason by itself to guide policy; however, complimenting existing policy frameworks when they are founded in solid scientific principles is sound policy: accounting for land use change

would directly address the "critical climate accounting error" outlined by a group of prominent scientists in the journal *Science*[8].

Recognition of Carbon Neutral Biomass Fuels

Biogenic emissions from the combustion with energy recovery of the biogenic portion of MSW, waste biomass, and residuals from sustainably managed forestry operations with energy recovery are widely recognized as having significant climate benefits. In the *Science* article "Beneficial Biofuels – The Food, Energy, and Environment Trilemma," the authors succinctly observe that "the search for beneficial biofuels should focus on sustainable biomass feedstocks that neither complete with food crops nor directly or indirectly cause land-clearing and that offer advantages in reducing greenhouse-gas emissions."[9] The authors identify five feedstocks, including municipal and industrial wastes and sustainably harvested wood and forestry residues that meet this definition. In the influential article "Fixing a Critical Climate Accounting Error," the authors specifically distinguish between residues or biowastes and other sources of biomass.[10] The benefits of these feedstocks should be recognized as carbon neutral in any GHG regulations promulgated under the Clean Air Act.

The GHG benefits of these feedstocks are directly related to the fact that they do not lead to land use change, either directly, or indirectly. As described in the preamble to the final changes to the renewable fuel standard (RFS2), the EPA agreed with this assessment, stating that "renewable fuel produced from feedstocks consisting of wastes that would normally be discarded or put to a secondary use, and which have not been intentionally rendered unfit for productive use, should be assumed to have little or no land use emissions of GHGs."[11]

The environmental and economic benefits of using waste biomass and residuals are well recognized, including by prominent environmental NGOs. A statement coauthored by a diverse set of environmental NGOs including Earthjustice, Environment Northeast, National Audubon Society, the Natural Resources Defense Council, the Sierra Club, The Wilderness Society, and the Union of Concerned Scientists states "renewable biomass resources, such as agricultural, forestry, and urban residues, as well as some dedicated energy crops, can be used to produce transportation fuels, electricity, and heat. These types of bioenergy can create jobs in rural communities, cut carbon pollution, and reduce our dependence on imported oil."[12] A recent paper co-authored by researchers from The Nature Conservancy and the University of Minnesota found that the use of waste biomass, including slash and thinning from sustainable forestry and crop residues "incur[s] little or no carbon debt and can offer immediate and sustained GHG advantages."[13] The World Wildlife Federation (WWF) recommends that the use of waste

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[8] Searchinger *et al.* "Fixing a Critical Climate Accounting Error" *Science* 326: 527-528.
[9] Tilman *et al.* Beneficial Biofuels – "The Food, Energy, and Environment Trilemma" *Science* 325: 270-271
[10] Searchinger *et al.* "Fixing a Critical Climate Accounting Error" *Science* 326: 527-528.
[11] "Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program; Final Rule." *Federal Register* **75**, 58 (March 26, 2010): 14670-14904.
[12] "Establishing a Sound Framework for Bioenergy in Clean Energy and Climate Protection Legislation" http://docs.nrdc.org/energy/files/ene_10042101a.pdf
[13] Fargione, J., J. Hill, D. Tillman, S. Polasky, P. Hawthorne. "Land Clearing and the Biofuel Carbon Debt" *Science* Published online February 7, 2008; 10.1126/science.1152747.

and by-products be promoted to reduce emissions associated with food crop displacement.[14]

Recognition of Biomass Fuels with Net Negative GHG Emissions

The use of many types of waste biomass actually results in net GHG reductions due to avoided emissions associated with normal disposal methods, such as landfilling or open burning.[15] Any policy for GHG accounting under the CAA should recognize important benefits realized outside of the immediate footprint of the facility through netting, offsets, or another mechanism.

As an illustrative example, waste-to-energy is a net reducer of greenhouse gas emissions compared to other waste management alternatives. Waste-to-energy avoids approximately 1 ton of carbon dioxide equivalents (CO_2e) for every ton of municipal solid waste (MSW) processed on a life cycle basis when using national averages.[16] This avoidance is based on four major greenhouse gas related processes:

1. Anthropogenic, or fossil CO_2, GHG emissions from combustion of waste components (plastics, textiles, etc.) made from fossil fuels such as oil and natural gas;
2. Avoidance of CO_2 from fossil fuel fired power plants on the local grid occurs due to the waste-to-energy facility generating renewable electrical power or steam;
3. Avoidance of landfill methane emissions from waste, including factoring-in methane capture, that would have been landfilled in the absence of the waste-to-energy facility; and
4. Avoidance of extraction and manufacturing GHG emissions due to ferrous metal recovery and recycling at waste-to-energy facilities.

The GHG mitigation potential of waste-to-energy is widely recognized, including by the United Nations Framework Convention on Climate Change, the European Union and the European Environmental Agency, the Global Roundtable on Climate Change convened by Columbia University's Earth Institute, and the U.S. Conference of Mayors.

In fact, the Nobel Prize winning Intergovernmental Panel on Climate Change ("IPCC") identifies waste-to-energy as a key GHG mitigation technology for the waste sector.[17] Waste-to-energy facilities in developing countries are eligible to generate tradable GHG credits under an approved CDM methodology. A recent paper coauthored by EPA and North Carolina State researchers demonstrated the value of waste-to-energy over landfilling from both a GHG and energy perspective.[18] The World Economic Forum at their 2009 meeting in Davos, Switzerland, identifies waste-to-energy as one of eight renewable technologies likely to make a meaningful contribution to a future low-carbon

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[14] WWF. "WWF Position Paper on Bioenergy – June 2008." http://assets.panda.org/downloads/wwf_position_paper_on_bioenergy_291107.pdf

[15] Morris, Gregory. Bioenergy and Greenhouse Gases. Green Power Institute, The Renewable Energy Program of the Pacific Institute. Berkeley, California. May 2008.

[16] B. Bahor, M. Van Brunt, K. Weitz, A. Szurgot, "Life Cycle Assessment of Waste Management Greenhouse Gas Emissions Using Municipal Waste Combustor Data" *J. Envir. Engrg.* **136**: 8, 749-755. http://dx.doi.org/10.1061/(ASCE)EE.1943-7870.0000189

[17] IPCC (2007)

[18] Kaplan, P.O, J. DeCarolis, and S. Thorneloe, 2009, Is it better to burn or bury waste for clean electricity generation? *Environ. Sci. Technology* 43 (6) pp1711-1717

energy system.[19] Finally, the Lee County Resource Recovery Facility recent capital expansion was the first to generate carbon offset credits in North America through the Voluntary Carbon Standard.

Without netting, offsets, or another mechanism to account for avoided GHG emissions, waste-to-energy facilities could incorrectly be identified as major greenhouse gas sources in direct contrast to widespread international recognition of its GHG benefits.

Conclusion

We urge EPA to move swiftly forward with its public review of biogenic carbon neutrality, using as its baseline sound scientific principles and peer reviewed literature on the climate impacts of various biogenic waste streams. Until this rulemaking process is finalized and EPA has assessed life-cycle impacts of various forms of biomass, we urge the Agency to exclude all biogenic emissions of CO_2 in determining permitting applicability under the Title V and PSD programs and to suspend application of the Tailoring Rule requirements to biogenic emissions. Such an approach will align the EPA's handling of biogenic CO_2 emissions with existing precedents and policies, including CEQ's recent guidance to federal agencies; until such time as a science based biogenic carbon policy can be finalized. Any forms of biogenic carbon emissions that EPA should elect in the future to include in the Title V and PSD programs may be added to existing permits in due time. However, should EPA persist with its current policy and then reverse its decision for certain forms of biogenic carbon already included in air permits, it will be very difficult to extract the exempted biogenic carbon emissions from approved air permits.

We appreciate your attention to this matter and look forward to working with EPA as the review of biogenic carbon neutrality proceeds. If you have any questions about these comments, please contact me at (202) 467-6240 or at tmichaels@energyrecoverycouncil.org.

Sincerely,

Ted Michaels
President

[19] World Economic Forum. *Green Investing: Towards a Clean Energy Infrastructure.* January 2009. http://www.weforum.org/pdf/climate/Green.pdf