

July 20, 2010

The Honorable Barbara Boxer  
Senate Environment and Public Works Committee  
Washington, DC

The Honorable James Inhofe  
Senate Environment and Public Works Committee  
Washington, DC

The Honorable Jeff Bingaman  
Senate Energy & Natural Resources Committee  
Washington, DC

The Honorable Lisa Murkowski  
Senate Energy & Natural Resources Committee  
Washington, DC

The Honorable Blanche Lincoln  
Senate Agriculture Committee  
Washington, DC

The Honorable Saxby Chambliss  
Senate Agriculture Committee  
Washington, DC

Dear Chairmen Boxer, Bingaman, and Lincoln and Ranking Members Inhofe, Murkowski, and Chambliss:

We write to express our concern that equating biogenic carbon emissions with fossil fuel emissions, such as contemplated in the EPA Tailoring Rule and other policies, is not consistent with good science and, if not corrected, could stop the development of new emission reducing biomass energy facilities. It could also encourage existing biomass energy facilities to convert to fossil fuels or cease producing renewable energy. This is counter to our country's renewable energy and climate mitigation goals.

The carbon dioxide released from the combustion or decay of woody biomass is part of the global cycle of biogenic carbon and does not increase the amount of carbon in circulation. In contrast, carbon dioxide released from fossil fuels increases the amount of carbon in the cycle.

The EPA's final Tailoring Rule defines what stationary sources will be subject to greenhouse gas (GHG) emission controls and regulations during a phase-in process beginning on January 2, 2011. In the draft Tailoring Rule, the EPA proposed to calculate GHG emissions relying on the EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks. In the final rule, EPA ignored its own inventory methods and equated biogenic GHG emissions with fossil fuel emissions, which is incorrect and will impede the development of renewable biomass energy sources.

The carbon released from fossil fuels has been long separated from the global carbon cycle and adds to the total amount of carbon in active circulation between the atmosphere and biosphere. In contrast, the CO<sub>2</sub> released from burning woody biomass was absorbed as part of the "biogenic" carbon cycle where plants absorb CO<sub>2</sub> as they grow (through photosynthesis), and release carbon dioxide as they decay or are burned. This cycle releases no new carbon dioxide into the atmosphere, which is why it is termed "carbon neutral". It is unrelated to the GHG emissions produced from extracting and burning fossil fuels, except insofar as it can be used to offset or avoid the introduction of new carbon dioxide into the atmosphere from fossil fuel sources. Biogenic GHG emissions will occur through tree mortality and decay whether or not the biomass is used as an energy source. Some regions of the United States have rampant wildfires contributing pulses of greenhouse gases to the atmosphere. Capturing the energy value of these materials thereby offsetting fossil fuel emissions generates a net effect from burning biomass that is better than carbon neutral.

In terms of their greenhouse gas properties, there is no difference between biogenic and fossil fuel carbon dioxide. The difference derives from where the carbon was sourced. Burning fossil fuels that are mined from millennia-old deposits of carbon produces an addition to carbon in the atmosphere, whereas burning woody biomass recycles renewable plant growth in a sustainable carbon equilibrium producing carbon neutral energy. Fossil fuels also produce other greenhouse gases and pollutants with more negative environmental impacts than woody biomass.

Though biogenic carbon is part of the natural carbon cycle, to be considered "absolutely carbon neutral" in the short term, biomass must be re-grown at the same rate it is consumed. Because forests and trees are changing constantly,

this does not happen everywhere at once. For example, the current bark beetle epidemic in the western United States has killed 17 million acres of forests. This will result in an unavoidable 'pulse' of carbon dioxide over several years and decades unless that material is used for products or energy that can offset the emissions from fossil fuels. Humans can mitigate some natural disturbances, but cannot stop them. As a result, the only way to ensure biomass is being replaced at the rate its removed is through sustainable forest management. The regeneration of the forest along with setting the volume of removals to be no greater than new growth less mortality results in stable levels of carbon in the forest and sustainable removals as a carbon neutral source for energy or other products.

While avoiding deforestation is important in developing countries and is of some concern around urban growth areas in the United States, reforestation, certification systems and programs promoting sustainable management of our working forests have resulted in forest increases exceeding losses. Currently, there are 750 million acres of forest land in the United States and this number is largely stable even as some forest land has been converted for development.<sup>1</sup> Forest growth nationally has exceeded harvest resulting in the average standing volume of wood per acre nation-wide increasing about 50% since 1952; in the eastern United States, average volume per acre has almost doubled. In the southeast, net volume of all trees increased 12% from 1997 to 2007 and forests are reforested and growing well.<sup>2</sup>

Forests are our nation's primary source of renewable materials and second largest source of renewable energy after hydropower. Sustainable development of new and traditional uses of our forests helps reduce GHG emissions<sup>3</sup> and has the important benefit of providing economic incentives for keeping lands in forests and reducing the motivation for land conversion.

A consortium of research institutions has, over the last decade, developed life cycle measures of all inputs and all outputs associated with the ways that we use wood: a thorough environmental footprint of not just managing the forest, but harvesting, transportation, producing products or biofuels, buildings or other products, maintenance and their ultimate disposal.<sup>4</sup> Results of this research are clear. When looking across the carbon life cycle, biomass burning does produce some fossil fuel emissions from harvesting, transportation, feedstock preparation and processing. These impacts, however, are substantially more than offset by eliminating the emissions from using a fossil fuel. Sustainable removals of biomass feedstocks used for energy produce a reduction in carbon emissions year after year through a reduction in fossil fuel emissions far greater than all of the emissions from feedstock collection and processing. When wood removals are used to produce both renewable materials as well as bio-energy, the carbon stored in forest products continues to grow year after year, more than off-setting any processing emissions while at the same time permanently substituting for fossil fuel intensive materials displacing their emissions.

Finally, biomass power facilities generally contribute to a reduction of greenhouse gases beyond just the displacement of fossil fuels. The use of forest fuels in a modern boiler also eliminates the methane (CH<sub>4</sub>) emissions from incomplete oxidation following open burning, land filling, or decomposition which occurs in the absence of a higher and better use for this material. Methane is a 25 times more powerful greenhouse gas than CO<sub>2</sub>. In contrast, the mining of coal and exploration for oil and gas release significant amounts of methane and other harmful pollutants into the environment. Any modeling to examine the impact of carbon-based fuel sources must account for all of these impacts.

We thank you for the opportunity to share our concern with the EPA's Tailoring Rule and other pending policies.

Sincerely,

---

<sup>1</sup> Mila Alvarez, *The State of America's Forests* (2007), 5.

<sup>2</sup> Smith, W.B., P.D. Miles, C.H. Perry and S.A. Pugh. 2009. *Forest Resources of the United States, 2007*. General Technical Report WO-78. U.S. Department of Agriculture, Forest Service. Washington, DC.

<sup>3</sup> CORRIM, "Maximizing Forest Contributions to Carbon Mitigation: The Science of Life Cycle Analysis – a Summary of CORRIM's Research Findings." CORRIM Fact Sheets #5, #6, #7 (2009).

<sup>4</sup> IPCC Fourth Assessment Report: *Climate Change 2007*. Working Group III: *Mitigation of Climate Change*. Chapter 9. Forestry

Bruce Lippke  
Past President of the Consortium for Research on  
Renewable Industrial Materials (CORRIM)  
Professor Emeritus  
School of Forest Resources  
University of Washington  
Seattle, WA

Elaine Oneil, PhD, RPF  
Executive Director of CORRIM and  
Research Scientist  
School of Forestry  
College of Forest Resources  
University of Washington  
Seattle, WA

Paul M. Winistorfer, PhD  
Dean  
College of Natural Resources and Environment  
Virginia Tech  
Blacksburg, VA

John A. Helms, PhD  
Professor Emeritus of Forestry  
University of California, Berkeley  
Berkeley, CA

Robert D. Brown, PhD  
Dean  
College of Natural Resources  
North Carolina State University  
Raleigh, NC

Mike Clutter, PhD  
Dean  
The Warnell School of Forestry and Natural Resources  
The University of Georgia  
Athens, GA

Cornelius B. Murphy, Jr., PhD  
President  
The State University of New York  
College of Environmental Science and Forestry  
1 Forestry Drive  
Syracuse, NY

Richard W. Brinker, PhD  
Dean & Professor  
School of Forestry & Wildlife Sciences  
Auburn University  
Auburn, AL

Janaki Alavalapati, PhD  
Professor and Head  
Department of Forest Resources and Environmental  
Conservation  
College of Natural Resources, Virginia Tech  
Blacksburg, VA

B. Bruce Bare, PhD  
Dean Emeritus and Professor  
College of Forest Resources  
University of Washington  
Seattle, WA

Emmett Thompson, PhD  
Dean Emeritus  
School of Forestry  
Auburn University  
Auburn, AL

James Burchfield, PhD  
Associate Dean  
College of Forestry and Conservation  
University of Montana  
Missoula, MT

Alan R. Ek, PhD  
Professor and Department Head  
Department of Forest Resources  
University of Minnesota  
St Paul, MN

Chadwick Dearing Oliver, PhD  
Pinchot Professor of Forestry and Environmental  
Studies, and Director, Global Institute of Sustainable  
Forestry  
School of Forestry and Environmental Studies  
Yale University  
New Haven, CT

Gary M. Scott, PhD  
Professor and Chair, Paper and Bioprocess  
Engineering  
Director, Division of Engineering  
The State University of New York  
College of Environmental Science and Forestry  
Syracuse, NY

Mark McLellan, PhD  
Dean for Research, Institute of Food and Agricultural  
Sciences  
Director, Florida Agricultural Experiment Station  
University of Florida  
Gainesville, FL

Said AbuBakr, PhD  
Professor and Chair  
Department of Paper Engineering, Chemical  
Engineering, and Imaging  
Western Michigan University  
Kalamazoo, MI

Gerry Ring, PhD  
Professor and Chair  
UWSP Dept. of Paper Science and Engineering  
Director of Education  
Wisconsin Institute for Sustainable Technology  
Associate Director for Education  
Wisconsin Bioenergy Initiative  
Stevens Point, WI

John M. Calhoun, Director  
Olympic Natural Resources Center  
School of Forest Resources  
College of the Environment  
University of Washington  
Seattle, WA

Jody Jellison, PhD  
Director  
School of Biology and Ecology  
University of Maine  
Orono, ME

Douglas D. Piirto, PhD, RPF  
Professor and Department Head  
Natural Resources Management Department  
California Polytechnic State University  
San Luis Obispo, CA

David Briggs, PhD  
Corkery Family Chair  
Director, Precision Forestry Cooperative  
and Stand Management Cooperative  
School of Forest Resources  
University of Washington  
Seattle, WA

David R. Larsen, PhD  
Department Chair and Professor of Forestry  
Department of Forestry  
The School of Natural Resources  
University of Missouri  
Columbia, MO

Ivan Eastin, PhD  
Director and Professor  
Center for International Trade in Forest Products  
School of Forest Resources  
University of Washington  
Seattle, WA

E. Dale Threadgill, PE, PhD  
Director, Faculty of Engineering and  
Head, Department of Biological and Agricultural  
Engineering  
University of Georgia  
Athens, GA

Barry Goldfarb, PhD  
Professor and Head  
Department of Forestry and Environmental Resources  
North Carolina State University  
Raleigh, NC

David Newman, PhD  
Professor and Chair, Department of Forest and Natural  
Resource Management  
The State University of New York  
College of Environmental Science and Forestry  
Syracuse, NY

Patricia A. Layton, PhD  
Professor and Chair  
Department of Forestry and Natural Resources  
Clemson University  
Clemson, SC

Lew P. Christopher, PE, PhD  
Professor and Director  
Center for Bioprocessing Research & Development  
South Dakota School of Mines and Technology  
Rapid City, SD

Jeff Hsieh, PhD  
Director  
Pulp and Paper Engineering  
School of Chemical and Biomolecular Engineering  
Georgia Institute of Technology  
Atlanta, GA

Thomas E. McLain, PhD  
Professor and Head  
Department of Wood Science & Engineering  
Oregon State University  
Corvallis, OR

Scott Bove, PhD  
Associate Professor & Wood Products Specialist  
Department of Forest and Wildlife Ecology  
University of Wisconsin  
Madison, WI

Stephen S. Kelley, PhD  
Professor and Department Head  
Department of Forest Biomaterials  
North Carolina State University  
Raleigh, NC

Eric J. Jokela, PhD  
UF/IFAS School of Forest Resources and Conservation  
University of Florida  
Professor of Silviculture & Forest Nutrition  
Co-Director, Forest Biology Research Cooperative  
Founding Editor-in-Chief -- *Forests*  
Gainesville, FL

Timothy L. White, PhD  
Director, School of Forest Resources and Conservation  
University of Florida  
Gainesville, FL

Michael J. Mortimer, JD, PhD  
Director, Graduate Programs  
Virginia Tech College of Natural Resources National  
Capital Region  
Falls Church, VA

Donald A. Bender, PE, PhD  
Weyerhaeuser Professor of Civil & Environmental  
Engineering  
Director, Composite Materials & Engineering Center  
Washington State University  
Pullman, WA

Timothy A. Martin, PhD  
Director, Carbon Resources Science Center  
University of Florida  
Gainesville, FL

Bob Izlar  
Director, Center for Forest Business  
Warnell School of Forestry and Natural Resources  
University of Georgia  
Athens, GA

John Carlson, PhD  
Professor of Molecular Genetics  
Director of the Schatz Center  
Penn State University  
University Park, PA

John Harrington, PhD  
Director, Mora Research Center  
New Mexico State University  
Mora, NM

Susan E. Anagnost, PhD  
Department Chair, Sustainable Construction  
Management and Engineering  
Associate Professor  
Assistant Director, N.C. Brown Center for Ultrastructure  
Studies  
President-Elect, Society of Wood Science and  
Technology  
Syracuse, NY

Thomas E. Hamilton, PhD  
Retired Director  
Forest Products Laboratory  
USDA Forest Service

Alain Cloutier, PhD  
Professor & Director  
Centre de recherche sur le bois  
Département des sciences du bois et de la forêt  
Faculté de foresterie, de géographie et de géomatique  
Université Laval  
Québec, QC

William W. Rice, PhD  
Professor Emeritus  
Wood Science and Technology  
Department of Natural Resources Conservation  
University of Massachusetts  
Amherst, MA

Frederick W. Cabbage, PhD  
Professor of Forest Policy Economics & Certification  
North Carolina State University  
Department of Forestry and Environmental Resources  
Raleigh, NC

John W Moser, PhD  
Professor Emeritus  
Department of Forestry and Natural Resources  
Purdue University  
West Lafayette, IN

Jim Bowyer, Director, PhD  
Responsible Materials Program  
Dovetail Partners, Inc.  
Minneapolis, MN

Lloyd C. Irland, PhD  
Lecturer and Senior Scientist  
Yale School of Forestry & Environmental Studies  
New Haven, CT

Robert Malsheimer, PhD  
Associate Professor of Forest Policy and Law  
The State University of New York  
College of Environmental Science and Forestry  
Syracuse, NY

Kevin L. O'Hara, PhD  
Professor of Silviculture  
University of California  
Berkeley, CA

Peter Kolb, PhD  
Montana State Extension Forestry Specialist  
Associate Professor Forest Ecology & Management  
University of Montana  
Missoula, MT

Larry Leefers, PhD  
Associate Professor  
Department of Forestry  
Michigan State University  
East Lansing, MI

Donald P. Hanley, PhD, CF  
Washington State University  
Extension Emeritus  
Kirkland, WA

Robert E. Froese, PhD  
Associate Professor  
School of Forest Resources and Environmental Science  
Michigan Technological University  
Houghton, MI

David R. Shonnard, PhD  
Robbins Professor  
Department of Chemical Engineering  
Michigan Technological University  
Houghton, MI

Walter R. Mark, PhD, CF  
Natural Resources Management Department  
California Polytechnic State University  
San Luis Obispo, CA

William Stewart, PhD  
Forestry Specialist  
University of California  
Berkeley, CA

William Boehner, PhD  
Affiliate Faculty Member  
Oregon State University  
Corvallis, OR

Barry Goodell, PhD  
Wood Science and Technology Program  
University of Maine  
Orono, ME

Robert L. Alverts  
Associate Research Scientist  
Desert Research Institute  
Tigard, OR

D. Steven Keller, PhD  
Associate Professor  
Miami University  
Paper and Chemical Engineering  
Oxford, OH

Michael R. Milota, PhD  
Oregon Wood Innovation Center  
Department of Wood Science and Engineering  
Oregon State University  
Corvallis, OR

Thomas M. Gorman, PE, PhD  
Professor, Forest Products  
University of Idaho  
Moscow, ID

Joseph P. Roise, PhD  
Professor of Forestry and Operations Research  
Department of Forestry and Environmental Resources  
North Carolina State University  
Raleigh, NC

Valerie Barber, PhD  
University of Alaska Fairbanks  
Forest Products Program  
Palmer Research & Extension  
Palmer, AK

Timothy A. Volk, PhD  
Senior Research Associate  
The State University of New York  
College of Environmental Science and Forestry  
Syracuse, NY

Norman Pillsbury, PhD, RPF  
Professor Emeritus  
Natural Resources Management Department  
California Polytechnic State University  
San Luis Obispo, CA

Richard B. Phillips, PhD  
Adjunct Professor of Forest Biomaterials Executive - in -  
Residence College of Natural Resources  
North Carolina State University  
Raleigh, NC

Dennis R. Becker, PhD  
Assistant Professor  
Department of Forest Resources  
University of Minnesota  
St. Paul, MN

Douglas Carter, PhD  
UF/IFAS School of Forest Resources and Conservation  
University of Florida  
Professor of Forest Economics  
Gainesville, FL

Zhu H. Ning, PhD  
Professor, Urban Forestry  
Southern University  
Baton Rouge, LA

Rob Harrison, PhD  
Professor of Soil & Environmental Sciences  
College of Forest Resources  
University of Washington  
Seattle, WA

Anthony D'Amato, PhD  
Assistant Professor  
Department of Forest Resources  
University of Minnesota  
St. Paul, MN

Bob Tjaden, PhD  
Specialist, Environmental/Natural Resource  
Management & Policy  
Environmental Science & Technology Department  
University of Maryland  
College Park, MD

P.K. Ramachandran Nair, PhD  
Distinguished Professor  
Agroforestry International & Forestry  
Director, Center for Subtropical Agroforestry  
School of Forest Resources and Conservation  
University of Florida  
Gainesville, FL

Wayne Smith, PhD  
Director Emeritus  
School of Forest Resources and Conservation  
University of Florida  
Gainesville, FL

Rick Gustafson, PhD  
Denman Professor of Bioresource Science and  
Engineering  
School of Forest Resources  
University of Washington  
Seattle, WA

Stephen Shaler, PhD  
Professor of Wood Science  
Associate Director Advanced Engineered Wood  
Composites (AEWC) Center  
Program Coordinator, Wood Science & Technology  
University of Maine  
Orono, ME

H. Michael Barnes, PhD  
W. S. Thompson Professor of Wood Science &  
Technology  
Department of Forest Products  
Mississippi State University  
Mississippi State, MS

Dale Greene, PhD  
Professor  
Center for Forest Business  
University of Georgia  
Athens, GA

Michael G. Messina, PhD  
Director, School of Forest Resources  
Penn State University  
University Park, PA

J. Michael Vasievich, PhD  
Adjunct Associate Professor  
Michigan State University  
Retired, USDA Forest Service  
East Lansing, MI

Kris Arvid Berglund, PhD  
University Distinguished Professor of Forestry and  
Chemical Engineering  
Michigan State University  
East Lansing, MI

Francisco X. Aguilar, PhD  
Assistant Professor of Forest Economics and Policy  
Department of Forestry  
The School of Natural Resources  
University of Missouri  
Columbia, MO

Bruce Cutter, PhD  
Professor of Forestry  
Department of Forestry  
The School of Natural Resources  
University of Missouri  
Columbia, MO

John P. Dwyer, PhD  
Associate Professor of Forestry  
Department of Forestry  
The School of Natural Resources  
University of Missouri  
Columbia, MO

Harold "Gene" Garrett, PhD  
Endowed Professor of Forestry  
Department of Forestry  
The School of Natural Resources  
University of Missouri  
Columbia, MO

Richard P. Guyette, PhD  
Research Professor of Forestry  
Department of Forestry  
The School of Natural Resources  
University of Missouri  
Columbia, MO

Jason A. Hubbart, PhD  
Assistant Professor of Hydrologic Processes & Water  
Quality  
Department of Forestry  
The School of Natural Resources  
University of Missouri  
Columbia, MO

Shibu Jose, PhD  
H.E. Garrett Endowed Professor and Director, Center for  
Agroforestry  
University of Missouri  
Columbia, MO

Chung-Ho Lin, PhD  
Research Assistant Professor  
Department of Forestry  
The School of Natural Resources  
University of Missouri  
Columbia, MO

William B. Smith, PhD  
Professor, Wood Products Engineering  
The State University of New York  
College of Environmental Science and Forestry  
Syracuse, NY

Hank Stelzer, PhD  
State Forestry Extension Specialist  
Department of Forestry  
University of Missouri  
Columbia, MO

Milagros Alvarez, PhD  
Adjunct Professor  
Virginia Tech College of Natural Resources  
National Capital Region  
Fairfax, VA

Michael R. Wagner, PhD  
Regents' Professor  
Northern Arizona University  
College of Engineering, Forestry & Natural Sciences  
Flagstaff, AZ

René Germain, PhD  
Associate Professor  
Forest and Natural Resources Management  
The State University of New York  
College of Environmental Science and Forestry  
Syracuse, NY

Charles Strauss, PhD  
Professor Emeritus  
School of Forest Resources  
College of Agricultural Sciences  
Penn State University  
University Park, PA

Harry Wiant, PhD  
Professor Emeritus  
Chair in Forest Resources Management  
School of Forest Resources  
College of Agricultural Sciences  
Penn State University  
University Park, PA

David Wm. Smith, CF, PhD  
Professor Emeritus of Forestry  
College of Natural Resources  
Virginia Tech  
Blacksburg, VA

Michael A. Kilgore, PhD  
Associate Professor and Director of Graduate Studies  
Department of Forest Resources  
University of Minnesota  
St. Paul, MN

Kaushlendra Singh, PhD  
Assistant Professor of Wood Science and Technology  
(Bioenergy and Biofuels)  
Division of Forestry and Natural Resources  
West Virginia University  
Morgantown, WV

Jeffrey Benjamin, PhD  
Assistant Professor of Forest Operations  
School of Forest Resources  
University of Maine  
Orono, ME

David W. Patterson, PhD  
Research Professor  
School of Forest Resources  
University of Arkansas at Monticello  
Monticello, AR

Frederick A. Kamke, PhD  
JELD-WEN Professor of Wood-Based Composite Science  
Department of Wood Science & Engineering  
Oregon State University  
Corvallis, Oregon

Sudipta Dasmohapatra, PhD  
Assistant Professor  
Department of Forest Biomaterials  
North Carolina State University  
Raleigh, NC

Robert L. Youngs, PhD  
Professor Emeritus  
College of Natural Resources  
Virginia Tech  
Blacksburg, VA

Blair Orr, PhD  
Professor  
School of Forest Resources and Environmental Science  
Michigan Technological University  
Houghton, MI

Charles D. Ray, PhD  
Associate Professor, Wood Operations Research  
The Pennsylvania State University  
University Park, PA

Jerrold E. Winandy, PhD  
Adjunct Professor  
University of Minnesota and  
Retired Project Leader of Engineered Composite Science  
USDA Forest Products Laboratory  
St. Paul, MN

Dr. Róbert Németh  
Associate Professor  
University of West Hungary  
Faculty of Wood Sciences  
Institute of Wood Sciences  
Sopron, Hungary

Craig E. Shuler, PhD  
Associate Professor Emeritus  
Dept. of Forest, Rangeland and Watershed Stewardship  
Warner College of Natural Resources  
Colorado State University  
Fort Collins, CO

Jae-Woo Kim, PhD  
Post-Doctoral Research Associate  
Forest Products Center  
Dept. Forestry, Wildlife and Fisheries  
University of Tennessee  
Knoxville, TN

Maureen Puettmann, PhD  
LCA Consultant,  
Environmental Product Analysis  
WoodLife  
Corvallis, OR

cc: Lisa Jackson, Administrator, Environmental  
Protection Agency