Sustainably Produced Bioenergy

California Biomass Collaborative 7th Annual Forum
May 10-11, 2010
Davis, California

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Can Bioenergy be Produced Sustainably?

- Biomass – for next generation biofuels and biopower – has the potential to reduce global warming pollution, and contribute to the protection of important environmental values if it is done right. But it can also be done wrong . . .
- Bioenergy is often presented in black and white terms—as entirely good or bad for the environment.
- The truth is that the impacts of production are very dependent on how, where, and what feedstocks are grown, and at what scale.

Why are Sustainability Standards important?

- Ensures that bioenergy delivers on its promise to reduce global warming pollution while protecting critical environmental values (e.g., soil, water, wildlife resources).
- Creates a level-playing field for performance across global sourcing regions (reducing potential for leakage).
- Incorporates cost effective metrics for evaluating actual performance on the ground.
- Sets expectations for performance in the marketplace – creating certainty – and directs project investments, infrastructure development and practices on the right path from the outset.

General Areas of Concern

- Appropriate scale and siting issues
- Global warming pollution
- Impacts on ecological/biodiversity values
- Impacts on water (quality and quantity)
- Impacts on soils (erosion and quality)
- Food security (displaced food and feed production/indirect land-use change)
- Social issues (labor, community benefits)
- Economic viability (costs and financial incentives)

Scale is important

- All renewable energy options have their pros and cons from an environmental standpoint, but the landscape level foot print of biomass production presents a particular challenge to ensuring sustainability.
- As we increasingly look to biomass crops for energy, we must keep in mind the cumulative land-use effects of increasing demand for energy, housing, food, feed, and fiber.
- With these competing demands in mind – we must also ensure that policies and practices do not create unintended counter-productive consequences - increasing global warming pollution, reducing soil productivity and the availability of clean water, or degrading natural ecosystems.

Sustainable Bioenergy: Reduces Global Warming Pollution

Overall global warming impact of a bioenergy source – the lifecycle greenhouse gas balance – must be accurately accounted for.

- Direct land-use change: When a forest is harvested, a wetland is drained, or a grassland is plowed for crop production, large amounts of carbon stored in these systems is released into the atmosphere.
- Indirect land-use change: Displaced production of food crops and wood fiber for existing markets can expand into carbon rich land that is then converted to meet that demand.
- Cultivation practices and inputs: The use of fertilizers, pesticides, irrigation and cultivation practices all contribute to overall emissions.
- Combustion/Processing for bioenergy: The combustion of biomass causes its own emissions. In order to offset combustion emissions, bioenergy must cause additional plant growth beyond what would occur without bioenergy and it must do so rapidly, over a matter of years not decades.

Sustainable Bioenergy: Protects Natural Ecosystems and Biodiversity

The cultivation of bioenergy feedstocks should not replace natural habitat and should employ practices that maintain and enhance habitat values.

- Sustainable practices should ensure that natural ecosystems are not converted for bioenergy production. This is a lose-lose proposition – releasing stored carbon as well as harming native biodiversity.
- Critical Habitat (terrestrial and aquatic) needs to be protected – e.g., habitat for T/E species, critically imperiled, imperiled and vulnerable species and communities; old growth forests and native grasslands.
- Management practices that maintain and enhance ecological functions and wildlife habitat should be employed in the working landscape. Crops that are potentially invasive should not be used.

Sustainable Bioenergy: Protects Water Quality/Reduces Impacts on Available Supplies

Producers should select crops that require little if any irrigation, and minimize the use of chemical inputs.

- By 2050, a third of the people on Earth may lack a clean, secure source of water. Irrigation consumes 70 percent of fresh water. More efficient approaches like micro-sprinklers can cut use by a third.
- Humans have almost doubled the input of available nitrogen to the Earth's land surface, largely through the industrial production and application of nitrogen fertilizer. Selection of perennial crops – such as switchgrass – and precision agriculture can be used to minimize use of fertilizers.
- Pesticides can drift into neighboring fields and communities, leach into surface and ground water and impact pollinators and other beneficial insects. Integrated Pest Management techniques should be employed to reduce and target the use of the least toxic alternatives.

Sustainable Bioenergy: Maintains or enhances Soil Quality

The choice of crops and cultural practices affects soil health, fertility and productivity.

- Soils should be periodically tested for organic matter and for nitrogen, phosphorus and other nutrients relevant to local resource concerns to establish baseline information, monitor changes and verify that practices are producing expected benefits.
- Selecting perennials or ensuring continuous cover can reduce erosion, increase soil organic matter, improve soil quality and reduce carbon emissions.

Policy Changes that Could Encourage a Transition to Sustainable Bioenergy

Sustainable biomass energy must account for real climate and environmental benefits.

- Accurate accounting for GHG emissions (including direct and indirect land-use change).
- A sound definition of “renewable biomass” that helps protect sensitive wildlife habitat and natural ecosystems.
- Performance-based incentives that reward producers for protecting air, soil, water and other critical environmental values.
- Establishment of stringent, cost effective quantification and measurement methodologies to maintain the integrity of performance-based standards.

Voluntary Certification

For more information on voluntary standards established for sustainably produced biomass derived from forests and agricultural crops:

- The Forest Stewardship Council (FSC) – International. Established in 1993. http://www.fsc.org
- The Roundtable on Sustainable Biofuels (RSB) – International. Established in 2007. First draft standard (Ver. Zero) released in 2008. Pilot testing Version One standard in 2010.

http://cgse.epfl.ch/page65660.html

- The Council for Sustainable Biomass Production (CSBP) – National (US) Established in 2007. Pilot testing provisional standard in 2010.

http://www.csbp.org

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