



## **Carbon Neutrality of Energy from Forest Biomass**

### **Biomass is Carbon Neutral**

The carbon neutrality of forest biomass used to produce electricity and heat is a long-established convention in greenhouse gas (GHG) accounting. The prevailing view in the science community, as acknowledged by the Environmental Protection Agency (EPA)<sup>1</sup>, is that carbon emissions from biomass are offset by the prior absorption of carbon through photosynthesis that created the biomass. In other words, the carbon that enters the atmosphere was previously absorbed from the atmosphere and will be reabsorbed when new biomass is grown – and the cycle continues when forests are replanted. This convention was established to recognize a fundamental difference between the use of fossil fuels and biomass to produce heat and energy. Fossil fuels transfer large amounts of carbon from geologic reserves, which are not quickly replaced, into the atmosphere and biosphere. Replacing fossil fuels with carbon neutral biomass reduces the rate of carbon transfer from geologic reserves.

### **Some Mistakenly Dispute the Carbon Neutrality of Energy from Forest Biomass**

Some have questioned the presumption that energy from biomass is carbon neutral, citing the potential that increases in demand for biomass energy attributable to the Kyoto Protocol and other climate policies can cause degradation and clearing of natural forests, thus causing an increase in atmospheric carbon<sup>2</sup>. This approach includes a recommendation for developing a new regulatory regime for biomass energy that includes the possibility of a cap on all land-use emissions and sinks – a policy acknowledged to be nearly impossible to implement, both politically and technically.

The challenge to the carbon neutrality presumption is based on the belief that the Kyoto Protocol and proposed U.S. national climate legislation mistakenly fail to account for bio-energy emissions, either at the time of combustion (at a smoke-stack or tail-pipe) or on the land. The argument maintains that this “accounting error” will incent the clearing of long-established forests and cause additional CO<sub>2</sub> emissions to the atmosphere. The proposed solution is to differentiate biomass energy as “carbon neutral” or “non-carbon neutral” based on its source. A facility that utilizes biomass energy would have to trace the source of its biomass and treat any biomass from sources that do not enhance plant growth or that are residues or biowaste as equivalent to fossil fuels.

---

<sup>1</sup> U. S. Environmental Protection Agency Combined Heat and Power Partnership, *Biomass Combined Heat and Power Catalog of Technologies*, 96 (Sept. 2007) available at [www.epa.gov/chp/documents/biomass\\_chp\\_catalog.pdf](http://www.epa.gov/chp/documents/biomass_chp_catalog.pdf).

<sup>2</sup> “Fixing a Critical Climate Accounting Error” *Science* 23 October 2009 p. 527-528.

## Public Policy Appropriately Recognizes Biomass Carbon Neutrality and its Public Benefits

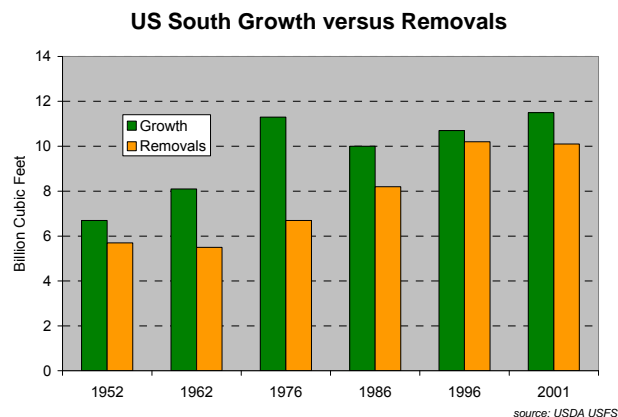
- In the U.S., working forests absorb over 15% of all GHG emissions, and globally, the land-to-atmosphere sink absorbs 14% of all carbon emissions.
- Research demonstrates that both sustainable forest management and forest protection can make contributions to GHG mitigation. The GHG benefits of management are associated with forest regrowth after harvest; lower risk of wildfire; production of energy-efficient materials and biomass energy; and carbon sequestration in forests and wood products.
- In the U.S., national GHG inventories recognize the carbon neutrality of biomass and also account for changes in the amount of carbon stored in forests, landfills and other pools. If carbon stocks start to decline, the reductions will show up as net increases in carbon emissions in the US inventory.
- The scientific literature is clear – sustainable forest management is a better strategy for controlling GHG emissions *over the long term*. Most experts understand that controlling GHGs is a very long-term challenge and that the long-term advantages of management are more relevant than short-term considerations. For example, the IPCC's Fourth Assessment Report concluded that, "In the long term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fiber or energy from the forest, will generate the largest sustained mitigation benefit."
- As a feature of national GHG accounting, biomass carbon neutrality has no effect on economic incentives for clearing and degradation of natural forests. The potential for perverse incentives identified by Searchinger *et al*<sup>3</sup> is not attributable to carbon neutrality *per se*, but rather the design of the Kyoto Protocol, which restricts recognition of forest carbon sequestration and encourages the export of carbon emissions from wealthier countries to developing countries.
- Climate and energy policy, if designed correctly, would completely negate the potential that biomass energy will create incentives to clear forest land for biomass. Policies that create new market opportunities will provide additional options for increasing value derived from forests *while retaining forests in a forested state*. Working forests should be able to participate in an offset system to generate value from the carbon storage in trees and products and through consumer demand for a low carbon footprint product. If climate and energy policy provide incentives for realizing full participation from private forests, then it is possible to achieve: 1) an increase in carbon sequestration on current and new land; 2) an increase in biomass use for energy; 3) an increased use of wood products as a substitute for more energy intensive materials; and, 4) a decrease in land-use change.

---

<sup>3</sup> Ibid.

## Eliminating the Carbon Neutrality Presumption Yields Unintended Consequences

- Eliminating or discouraging the use of biomass energy fosters continued end-user reliance on fossil fuels, which release stored carbon and do not have the added benefit of replacement fuel that quickly absorbs additional carbon from the atmosphere.
- Requiring facilities to trace the source of biomass ignores the intricacies of biomass energy supplies, resulting in restricted supplies and disincentives to maintain working forests and farms. Increased demand for biomass will stimulate supply, as there will be more investments in forest management and productivity. The U.S. South has shown, for example, that though harvest has increased dramatically over last 50 years, growth has consistently exceeded harvest. The reason is that supply consistently tracks the demand created by viable markets.



- Applying a carbon cap to energy production and associated forest management will incent further fragmentation and land-use change. Nearly 10 million private forest owners own or manage approximately 500 million acres of forests in the U.S. ranging in size from a few to millions of acres. Any carbon reporting requirement applied to private forests would be extremely costly and administratively impossible to require reporting on every property. A reporting requirement applied only to the larger acreages would further stimulate a trend toward acreages falling below the threshold size.