Developing New Markets:
Carbon Trading, Biomass, and Ecosystem Services

By *Walter E. Cartwright,* RF
Assistant Forest Management Division Director, Alabama Forestry Commission

New markets are evolving for forest products, forest biomass, carbon storage, and many ecosystem services such as water quality, wildlife habitat conservation, protection of threatened and endangered species habitat, and others. One Texas utility is paying landowners to protect habitat for an endangered warbler, along with purchasing carbon credits from those same landowners to offset nearly 85 million tons of carbon emissions per year from their coal-fired facilities. This article will discuss efforts underway to develop and promote new markets for timber landowners willing to participate in new initiatives.


Photo by Kelvin Daniels

CARBON TRADING

Because of the perception that greenhouse gas emissions, particularly carbon dioxide, are causing global warming, "Cash for Carbon" is the cry being heard among many landowner groups that are being asked to profit from the sale of carbon stored in their forests from the process of converting carbon dioxide (CO_2) to carbon and oxygen. Carbon is stored in the tree bole, limbs, roots and many other shrubs in the forest. Carbon Aggregators are trying to buy those credits and asking landowners to enter into long-term agreements to store carbon over long time periods. Contracts are renegotiated approximately every five years due to price fluctuations in this evolving market. At present, the Chicago Climate Exchange is the only market trading carbon credits in the United States. More detailed information can be obtained on their website at **www.chicagoclimatex.com**, where the price as of the end of August 2007 was near $3.00 per metric ton of CO_2, down from nearly $5.00 per ton in June 2007.

What does all this mean for a landowner with a healthy, growing stand of timber in Alabama? Well, it depends on many factors, including stand age, size, density, species, and management intensity. Basically, a young healthy stand of loblolly pine on good soil, being managed for maximum growth will capture and retain about two tons of carbon per acre per year. A ton of carbon is equal to 3.87 tons of CO_2, so that stand will store 2 x 3.87 or 7.74 tons of CO_2 per acre per year. At the current market price of $3.00 per ton, a landowner could sell his carbon credits for $23.22 per acre per year for the term of the contract. These dollar values are for illustrative purposes only, and will fluctuate with market price and the above factors indicating how fast a stand is growing and storing carbon.

Some states have recognized the need to set up a Carbon Registry to allow landowners to record carbon credits being stored on their properties and be a clearinghouse of information for landowners, aggregators, legislators, and others. Our neighboring State of Georgia has established a Carbon Credit Registry and has begun certification of registered foresters to educate them on their carbon measurement protocols and have creditable data being entered into the registry. Their protocol only allows credits for merchantable tree stems, as measured

inside bark, and does not consider carbon in tops, limbs, stumps, and roots. The logic is that these materials will be left in the woods to decay, thereby releasing the carbon back to the atmosphere. However, registered foresters have the option of using volume tables established by the University of Georgia or using their own volume tables to enter data.

The Alabama Forestry Commission has recognized the need to take the lead in setting up a similar registry in Alabama, not only so that landowners will have the same opportunities as other states, but also to establish a uniform protocol for measuring and reporting carbon credits. Discussions are underway with stakeholder groups to plan a strategy for setting up this registry and decide on protocols that would be used to measure volume and carbon credits being stored in each particular stand of timber.

A word of caution is advised on the continued perception that global warming is a reality. A recent article entitled, "Global Warming: Man-Made or Natural" by Dr. S. Fred Singer, Professor Emeritus of Environmental Sciences at the University of Virginia, delivered during a seminar on Economics and Environment, states that all scientific evidence indicates that greenhouse gas emissions are not causing a warming of the environment, but rather have an overall "cooling effect." The article states, "Human activities are not influencing global climate in a perceptible way. Climate will continue to change, as it always has in the past, warming and cooling on different time scales and for different reasons, regardless of human action. I would also add that – should it occur – a modest warming on the whole would be beneficial. This is not to say that we don't face a serious problem, but the problem is political. Because of the mistaken idea that governments can and must do something about climate, pressures are building that have the potential of distorting energy policies in a way that will severely damage national economies, decrease standards of living, and increase poverty."

Dr. Singer closes with, "It is a great shame that so many of our resources are being diverted from real problems to this non-problem. Perhaps in ten or twenty years this will become apparent to everyone, particularly if the climate should stop warming (as it has for eight years now) or even begin to cool. Today the imposed costs are still modest, and mostly hidden in taxes and charges for electricity and motor fuels. If the scaremongers have their way, these costs will become enormous. But I believe that sound science and good sense will prevail in the face of irrational and scientifically baseless climate fears." (Reprinted by permission from *Imprimis*, a publication of Hillsdale College, August 2007, Volume 36, Number 8.)

WOODY BIOMASS TO ENERGY

Forest residues have been used to fuel boilers in a mix with coal, fuel oil, and natural gas for over 30 years. The difference now is that almost NO residues are left in the woods after a logging operation, and almost all mill residues are being used by some industry to offset their energy costs. We have frequent calls from industries wanting to find a source of mill residues, especially when natural gas prices surge and carbon dioxide emission standards are harder and harder to meet. One recent test of fine woody biomass mixed at 1% with coal fines reduced emissions by 30%. That revelation has led to further tests with higher percentages of woody biomass to determine the reduction in emissions.

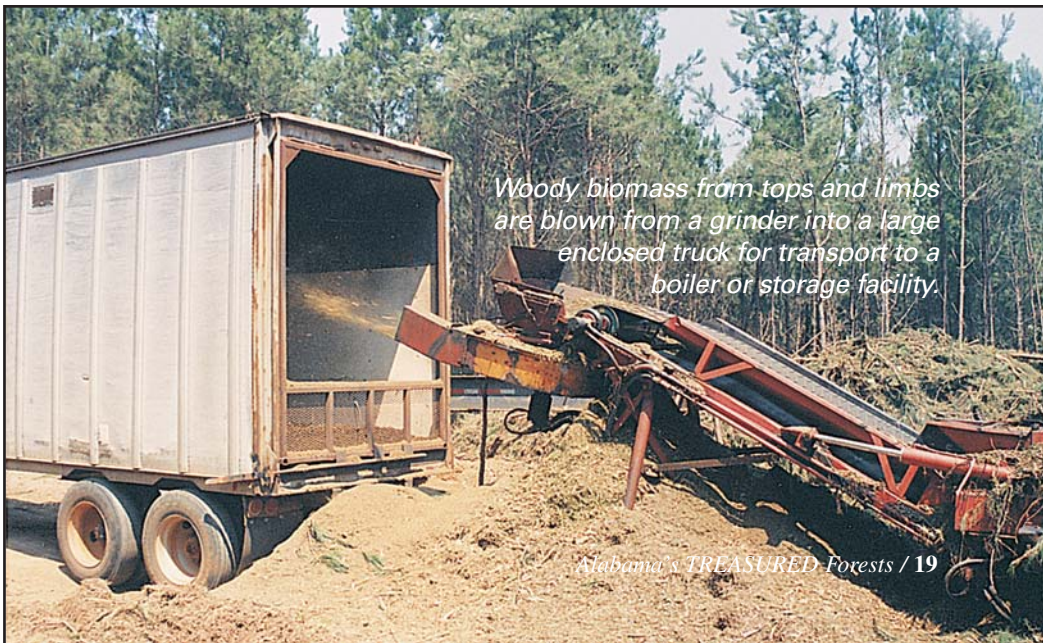
Congress is appropriating billions of dollars for research and development of technologies that would convert woody biomass to ethanol, methanol, and other chemicals. Several grants were awarded to partnerships between forest industry and major oil companies, while others have been awarded to the major chemical companies to develop an enzyme that would convert woody biomass to cellulosic ethanol. Biomass Gas & Electric Company (BG&E) announced plans to build the largest waste wood-fired power-generating plant in the United States. The company recently signed a 20-year Power Purchase Agreement (PPA) with Progress Energy Florida to provide the utility with electric power. A 75-megawatt renewable energy plant will be built on a Florida site to be determined later.

BG&E's advanced technology uses a two-step process. First, the woody biomass is superheated in an oxygen-free environment to produce a synthetic gas, which powers a turbine to generate electricity. Heat from that process is captured in a second system, which produces steam to run a generator and produce additional power. This highly efficient and extremely low-emission process – called "combined cycle" – offers a significant power production alternative that is both cost-competitive and environmentally friendly. The Progress Energy contract is the third signed by BG&E. Previous agreements were signed with the city of Tallahassee, Florida, and Georgia Power Company.

Alabama's Alternative Energy Advisory Group, Biofuels Committee recommendations to Governor Riley included "biomass to energy" and several other alternative energy resources and incentives including:

- Encourage alternative transportation fuel usage by state agencies and other governmental entities.

(Continued on page 20)



Woody biomass from tops and limbs are blown from a grinder into a large enclosed truck for transport to a boiler or storage facility.

Developing New Markets:

(Continued from page 19)

Photo courtesy of Kronospan

Kronospan's $500 million facility is nearing completion and will use a tremendous volume of wood across all size classes. This manufacturer will employ over 700 people in the Calhoun and Talladega counties area.

- Provide funding for alternative fuel research, development, and education.
- Feedstock development.
- Establish an *Alabama Energy Commission*.
- Incentives for bio-fuel feedstock producers.
- Income tax credit for retail distribution and infrastructure.
- Incentives for consumers.
- Bio-fuel production incentives.
- Establish an *Interagency Alternative Fuels Working Group*.
- Quality assurance to meet fuel ASTM (American Society for Testing and Materials) national standards.
- Legislation developed in regard to alternative fuels should be economically feasible and include provisions for tax-exempt entities.

OTHER ECOSYSTEM SERVICES

The term "ecosystem services" is becoming more familiar to the forestry community as corporations, landowner groups, and environmental groups, along with the federal government, are paying landowners to create, preserve, or restore critical habitats for threatened or endangered species. Some payments are made for mitigation of natural resources that were destroyed by development or pollution. Several states have even purchased property and/or long-term easements to protect critical watersheds that filter their municipal water supply. Alabama can certainly understand that strategy as we suffer through a 100-year drought for the second year. Clean air, water, recreation, aesthetics, wildlife, and wildlife habitats are increasingly important to Americans, many of which live in urban settings and rarely get out to the country to enjoy nature in its purest forms. As discussed above, "perception is reality" to most people; however, we already know that our forests are being fragmented and the average ownership in Alabama has dwindled to an average of just over 50 acres. These ecosystem services will become even more valuable as land patterns change, urban centers grow, and management schemes evolve to protect all the different components.

MARKETS FOR PRODUCTS

New markets will be purchasing smaller timber products in the near future as three major manufacturers open for business. Louisiana Pacific Corporation will begin manufacturing oriented strand board at a facility in Thomasville, Alabama. They will purchase small pulpwood-size trees and reportedly use 185 loads per day. That area in the Southwest part of the state has lacked a market for pulpwood since the closing of two major pulp mills.

In Meridian, Mississippi, a new plant that manufactures engineered wood products will begin operation soon, drawing wood from West Central Alabama. They too will use small pulpwood in their process and increase the demand for those products. Landowners will definitely benefit from the demand pressures and resulting price increases for their wood products.

Another major industry, Kronospan U.S., L.L.C., will start up soon in the Anniston, Alabama, area and will use a tremendous volume of wood across all size classes. This integrated plant will produce several products from oriented strand board, laminated wood flooring, medium density fiber board, and several other products. They also hope their facility will be energy self-sufficient, using by-products from the mill.

Many other forest products industries have expanded, investing billions in Alabama to improve their processes, increase mill capacities, create more jobs, and use more forest products. During 2005, there were 69 announcements of new and expanding businesses, creating 2,830 new jobs and investing $630.8 million. Kronospan alone had a capital investment of $500 million! During 2006, there were 74 announcements of new and expanding businesses, creating 1,905 new jobs, and investing $352 million.

More detailed information can be found in the 2006 Forest Resource Report on the Alabama Forestry Commission website at **www.forestry.alabama.gov.**