Forest Stewardship Videoconference: 
*Survive the Changes - Greenbelt Update and New Market Opportunities*

June 17, 2008
Alachua, Duval, Gadsden, Hillsborough, Jackson, Madison, Miami-Dade, Santa Rosa, St. Johns and Walton Counties

Funding for Florida’s Forest Stewardship Program is provided by the USDA Forest Service through Florida Department of Agriculture and Consumer Services Division of Forestry and a grant from the Sustainable Forestry Initiative
**THANKS** to our **Sponsors** for their support of this year’s Florida Forest Stewardship Program Events

<table>
<thead>
<tr>
<th>Sponsor</th>
<th>Contact Information</th>
</tr>
</thead>
</table>
| Blanton’s Longleaf Container Nursery                                   | Mr. Jason Blanton  
1091 NE Day Lily Avenue  
Madison, FL 32340  
(850) 973-2967  
blantonsnursery@earthlink.net |
| Florida Farm Bureau Federation                                         | Mr. Kevin Morgan  
PO Box 147030  
Gainesville, FL 32614-7030  
(352) 374-1537  
Kevin.morgan@ffbf.org |
| Jowett & Wood Consulting Foresters, Inc.                              | Mr. Ralph L. Jowett, Jr.  
P.O. Box 2194  
High Springs, FL 32655-2194  
Phone: (386) 454-4443  
jforester@aol.com |
| Environemental Services, Inc.                                          | Mr. Scott Sager  
7220 Financial Way  
Suite 100  
Jacksonville, FL 32256  
(904) 470-2200  
ssager@esinc.cc |
| Florida Forestry Association                                          | Mr. Jeff Doran  
PO Box 1696  
Tallahassee, FL 32302-1696  
(850) 222-5646  
info@forestfla.org |
| Manning Forestry                                                       | Mr. Antoney Manning  
11865 Register Farm Road  
Tallahassee, Florida 32305  
(850) 544-3940  
Manningforestry@yahoo.com |
| F&W Forestry Services, Inc.                                           | Mr. Russ Weber, ACF, CF  
4631 NW 53rd Avenue  
Suite 102  
Gainesville, FL 32606  
(352) 377-2924  
RWeber@FWForestry.com |
| Forestland Management, Inc.                                           | Mr. Ray Horne  
14616 SW 151st Ave  
Brooker, FL 32622  
(352) 485-1924  
rhorne1964@earthlink.net |
| Farm Credit of North Florida                                          | Ms. Torie Hardee  
12300 US Hwy 441  
Alachua, FL 32615-8500  
(386) 462-7649  
vhardee@fcnf.com |
| International Forest Company                                          | Mr. Wayne Bell  
1265 GA Hwy 133 N  
Moultrie, GA 31768  
(229) 985-0321,  
(800) 633-4506  
Mobile: (229) 873-4316  
wbell@interforestry.com |
| Marden Industries, Inc.                                                | Mr. Dan Darby  
PO Box 796  
Mulberry, FL 33860-0796  
(800) 881-0388 ext.33  
mardenind@mindspring.com |
| Farm Credit of Northwest FL                                           | Mr. Rick Bitner  
PO Box 429  
Monticello, FL 32344  
(850) 997-3545  
rbitner@farmcredit-fl.com |
| Southern Forestry Consultants, Inc.                                    | Mr. David S. Lewis  
105 W. Anderson Street  
Monticello, FL 32344  
(850) 997-6254  
sfcidl@earthlink.net |
| Jowett & Wood Consulting Foresters, Inc.                              | Mr. W. Leonard Wood  
PO Drawer 6339  
Fernandina Beach, FL 32035  
Phone: (904) 277-2467  
jandwforesters@aol.com |
| Suwannee Lumber Company                                               | Mr. Anthony Boggess  
PO Box 5090  
Cross City, FL 32628  
(352) 498-3363  
boggess1@windstream.net |
Forest Stewardship Videoconference:

*Survive the Changes – Greenbelt Update and New Market Opportunities for Landowners*

Date and Locations: *June 17, 2008; 1:00 – 5:00 PM ET (12:00 – 4:00 PM CT); at 10 Florida locations.*

The transformations taking place in Florida’s forestry landscape are producing many challenges and opportunities for private landowners and resource professionals. One major concern has been the uniform application of property tax appraisal procedures on forest lands actively managed for timber production and natural resource values in different counties. This program will give an update on the statutes and guidelines for agricultural appraisal for timberlands at the state level and describe how those may play out locally. We will also discuss two new enterprises that are getting much attention at the local, state, national and international level – energy wood and carbon trading.

Tentative Agenda (all times Eastern):

<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 pm</td>
<td>Sign in at facility</td>
</tr>
<tr>
<td>1:30</td>
<td><strong>Program introduction</strong>, <em>Chris Demers, UF-IFAS School of Forest Resources and Conservation (SFRC)</em></td>
</tr>
<tr>
<td>1:45</td>
<td><strong>Greenbelt guidelines for bona-fide forestry</strong>, <em>Don Curtis, The Forestry Company and Redgie Tedder, Forestry &amp; Greenbelt Consulting</em></td>
</tr>
<tr>
<td>2:45</td>
<td>Break</td>
</tr>
<tr>
<td>3:00</td>
<td><strong>Woody biomass: renewable energy resources</strong>, <em>Dr. Jarek Nowak, Florida Division of Forestry</em></td>
</tr>
<tr>
<td>3:30</td>
<td><strong>Economic availability of biomass resources</strong>, <em>Dr. Matthew Langholtz, BioResource</em></td>
</tr>
<tr>
<td>4:00</td>
<td><strong>Carbon trading: how to get paid to grow trees</strong>, <em>Andrew Walmsley, Florida Farm Bureau</em></td>
</tr>
<tr>
<td>4:45</td>
<td>Last round of questions, discussion, closing remarks, evaluation, adjourn</td>
</tr>
</tbody>
</table>

A service of:  
*Florida Division of Forestry, Forest Stewardship Program*  
University of Florida, IFAS, School of Forest Resources and Conservation,  
Cooperative Extension Service, Communication Services  
USDA Forest Service, Interface South, Wood to Energy  
Florida Farm Bureau  
BioResource  
Forestry & Greenbelt Consulting  
The Forestry Company

Funding for Florida’s Forest Stewardship Program is provided by the USDA Forest Service through the Florida Department of Agriculture and Consumer Services Division of Forestry and a grant from the Sustainable Forestry Initiative
Workshop Organizers and Presenters

Andrew Walmsley  
Ag Policy Division  
Florida Farm Bureau  
5700 SW 34th Street  
Gainesville, FL 32608  
(352) 378-8100, ext. 1108  
Andrew.walmsley@ffb.org

Chris Demers  
UF Forest Stewardship Coordinator  
UF-IFAS School of Forest Resources and Conservation  
PO Box 110410  
Gainesville, FL 32611-0410  
(352) 846-2375  
cdemers@ufl.edu

Jarek Nowak  
Forest Utilization Specialist  
Florida Division of Forestry  
3125 Conner Blvd  
Tallahassee, FL 32399  
(850) 414-9936  
nowakj@doacs.state.fl.us

Don Curtis  
President  
The Forestry Company  
502 West Green Street  
Perry, FL 32347  
(850) 584-8887  
drcurtisjr@hotmail.com

Dr. Matthew Langholtz  
Project Director  
BioResource  
3520 NW 43rd St  
Gainesville, FL 32606  
(352) 505-4644  
ml@bio-resource.com

Redgie Tedder  
President  
Forestry & Greenbelt Consulting  
3683-B Donovan Drive  
Tallahassee, FL 32309  
(850) 877-3292  
Redgietedder@wmconnect.com

Questions about this or other Forest Stewardship Program activities can be directed to Chris Demers at 352-846-2375 or by email at cdemers@ufl.edu. For more information and events see the UF Forest Stewardship Web site at:

http://www.sfrc.ufl.edu/Extension/florida_forestry_information/index.html
Greenbelt Guidelines
Greenbelt Taxation
for
Forestry Lands

June 17, 2008

Don Curtis
The Forestry Company

Redgie Tedder
Forestry and
Greenbelt Consulting
2006 Press Articles / Releases

• FL Senate Finance & Tax Committee to hold hearings on Greenbelt Reform

• FL Senate claims Greenbelt costs Florida $950 million each year

• Legislature drafts SB2378/HB1385 to curb Greenbelt abuses by those claiming to be in the ag business, while really preparing to develop their lands.

• Hernando County farms being sold to developers for $40K/acre. One farmer says, “Every dairy farm in FL is for sale for the right price.”

• Sugar farmers propose turning 14,000 acres into suburbs.

• Senator Geller says of land cleared by developer, “People were having to shoo the cows away from the bulldozers. But as long as you can call up Hertz Rent-A-Cow and have 6 cows on the property, then you’re still entitled to get the ag (greenbelt) exemption.”

• 1,380 acre parcel covered in planted pines is the future site of the Sunrise development: 4,800 residential units and 430,000 square feet of retail space. With the greenbelt exemption, the owner pays only $3,880 in taxes.

• Legislature decides to study greenbelt for a year before going ahead with legislation to correct abuses.

• Other states such as Idaho and South Carolina have similar problems. Idaho, in March, eliminated its “developers discount” which benefited non-working farmlands. In South Carolina, a 5-acre beachfront lot on upscale Kiawah Island is valued at $7 million, but taxes are $9.60 a year as timberland.

• Hillsborough County criticized for not having acreage minimums for greenbelt properties.
Guideline Development

- Review existing greenbelt guidelines for various counties in central and northern Florida
- Conduct current review of greenbelt case law, Attorney General opinions and statute

Bona Fide Forestry Guideline Highlights

- Description of common forest products and two types of forested properties
- Physical characteristics to observe
- Landowner documentation to support practice of “Bona Fide” forestry

Crystal Ball

- Guidelines versus legislation (Hillsborough County, FFA and Property Appraisers statewide)
- Current tax reform will “push” counties to refuse questionable properties
- Legislature will address greenbelt again in next 2-3 years
Silviculture (the practice of forestry) in Florida means producing raw material (trees) that eventually can be harvested for monetary value. Those raw materials serve as the manufacturing base for multiple forest products used by a wide variety of consumers. Common raw materials from Florida’s forest lands, and the consumer products for which they are used, can include (but are not limited to) the following:

- Fence Posts or other Fencing Materials
- Firewood
- Flooring
- Lumber
- Timber Piling
- Oriented Strand Board (OSB)
- Paneling
- Particle Board
- Pine Straw or Mulch Wood for landscaping
- Plywood
- Pulp and Paper
- Trees grown for the Sequestration of Carbon/Sale of Carbon Credits
- Utility Poles
- Veneer for Crates or Other Products
- Wood for Energy Production

The preceding list should not be construed as being all-inclusive: there are other forest products, but these are the most common. For forestland to be considered “bona fide” silviculture, the land should be growing trees and the landowner should periodically be harvesting and selling some forest products, based on available markets. Bona fide silviculture operations, however, often exhibit extended periods where harvests do not occur. Therefore, periods of harvest inactivity should not necessarily disqualify a property, assuming future plans include commercial harvests.
Silviculture in Florida is generally comprised of two types of forest management regimes: Planted Forests (also known as “plantations”) and Natural Forests as described below. These regimes may be employed individually or in combination.

1. **Planted Forests.** While the intensity of management can vary, planted forests generally involve some sort of site preparation, and either hand or machine planting of the seedlings or, rarely, direct seeding. Other more intensive cultural treatments such as herbicide and fertilization treatments may or may not be applied to the planted trees depending on economic considerations and the management objectives for the forest. It should be recognized that some planted forests are managed more intensively than others. For example, more intensive management regimes may include practices such as regular applications of fertilizer and herbicide treatments, while less intensive regimes may forego this activity. Both intensive and non-intensive management of planted forests should be considered bona fide silvicultural practices.

2. **Natural Forests.** Natural forest production is characterized by forests established by natural seeding of trees or coppice (stump sprouting). These forests can be found on wetland or upland sites and can include pine and non-pine species. Tree spacing is not necessarily optimized for growth, and size and age-classes may vary widely among species and forests. Management activities between the establishment of the forest and the eventual harvest tend to be minimal or even non-existent. Timber harvesting occurs less frequently and unpredictably, and may be driven more by markets and landowner objectives than by a planned harvest age. Because these natural forest management regimes are regenerated by natural seeding and coppicing, recently harvested natural forests do represent a continuing silvicultural use, assuming no conversion to another use takes place.

**Greenbelt Guidelines**

When evaluating forestlands as bona fide silviculture, the evidence revealed by an inspection of the property should be the primary indicator whether a property is being used for silviculture. In the absence of evidence to the contrary, a forested property with trees that have (or eventually will have) market value should be considered as strong evidence that the property is a bona fide silvicultural operation. While the property inspection should provide all the information needed to determine that a property is being used for silvicultural purposes, the condition of some properties may require follow up with the particular landowner. An example would be a property in a developing area that has recently been clearcut and there is no evidence of reforestation activities. In
such a case, the landowner should be contacted to determine if he/she has plans to reforest the property or to convert it to another use.

Below are some suggested questions that could be asked to further evaluate a questionable property. While answering “yes” to all of the questions is not practical, an affirmative answer to numbers 1 and 2 is probably most indicative that the property is being used for silviculture. It should be kept in mind, however, that many landowners, especially those with small properties, may not have (and do not necessarily need) a written management plan for their silvicultural operation. Affirmative answers to the other questions provide additional evidence that a forest management plan is being implemented for bona fide silviculture. When evaluating a natural forest as bona fide silviculture, keep in mind that a natural forest can be young growth (seedling or sapling size trees) or old growth (trees over a century old). It can be lightly stocked (less than 50 trees/acre) or so thick so as to seem almost impenetrable, and it can be predominately pine or hardwood, or a mixed forest.

Considerations for Property Evaluation

1. Is there a forest management plan for the property?

2. Is the plan being implemented?

3. What is the size of the property? Typically, a forest should be at least 10 acres in size to be viable for commercial silviculture and sustainable forest product removal. However, it should be noted that in some cases smaller tracts, especially those with exceptionally large timber, can be harvested commercially and should qualify as bona fide silviculture.

4. Is there other documentation to substantiate bona fide silviculture as referenced in Florida Statutes, Section 193.461(3)(a)?

5. Is the property enrolled in any type of third party certification program such as the American Tree Farm System, Florida Forest Stewardship Program, Sustainable Forestry Initiative, etc.?

These guidelines should benefit both the property appraiser’s office and landowners in understanding what constitutes bona fide silviculture. As with any set of guidelines, unique conditions may warrant a variance. However, those variances should be the exception – not the rule.
## 2006 Timberland Examples

<table>
<thead>
<tr>
<th>Acres</th>
<th>GB Gross $</th>
<th>GB $/Acre</th>
<th>Non-GB Gross $</th>
<th>Non-GB $/Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>185</td>
<td>529</td>
<td>2.86</td>
<td>8,419</td>
<td>45.51</td>
</tr>
<tr>
<td>13</td>
<td>52</td>
<td>4.03</td>
<td>3,375</td>
<td>259.60</td>
</tr>
<tr>
<td>24</td>
<td>1,304</td>
<td>54.33</td>
<td>94,223</td>
<td>3,925.96</td>
</tr>
<tr>
<td>94</td>
<td>575</td>
<td>6.11</td>
<td>68,908</td>
<td>733.06</td>
</tr>
<tr>
<td>20</td>
<td>1,650</td>
<td>82.50</td>
<td>12,188</td>
<td>609.40</td>
</tr>
<tr>
<td>40</td>
<td>157</td>
<td>3.93</td>
<td>2,041</td>
<td>51.02</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td>189,154</td>
<td>503.07</td>
</tr>
<tr>
<td>376</td>
<td>4,267</td>
<td>11.35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Application and retention;
2. Background, history, and requirements under the law;
3. Appeals process for denials;
4. Qualification;
5. The possible effects on Greenbelt property taxation resulting from passage of Amendment I in January, 2008;
6. Changes made by the 2008 Legislature to the Greenbelt law, and possible effects of other statutory changes on Greenbelt assessments;
7. Pending constitutional amendments placed on the Fall ballot by the Taxation and Budget Reform Commission.
GREENBELT DEFINITIONS, PURPOSE, HISTORY

What is it?

What is the purpose?

Constitution

Statutes

Classified Use Guidelines
### TIMBERLAND VALUE TABLE

**Management Cost per Acre:**

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>SITE INDEX</th>
<th>YIELD **</th>
<th>PRICE / CORD</th>
<th>PRICE/ CORD = GROSS INCOME</th>
<th>COST</th>
<th>NET INCOME</th>
<th>÷</th>
<th>CAP RATE</th>
<th>÷</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timberland No. 1</td>
<td>90 +</td>
<td>1.62</td>
<td>20.00</td>
<td>32.40</td>
<td>5.00</td>
<td>27.40</td>
<td>0.1000</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural (95 Avg.)</td>
<td>1.98</td>
<td>x</td>
<td>20.00 = 39.60</td>
<td>5.00 = 33.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$274</td>
</tr>
<tr>
<td>Timberland No. 2</td>
<td>80-89</td>
<td>1.28</td>
<td>20.00</td>
<td>25.60</td>
<td>5.00</td>
<td>20.60</td>
<td>0.1000</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural (85 Avg.)</td>
<td>1.48</td>
<td>x</td>
<td>20.00 = 29.60</td>
<td>5.00 = 23.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$236</td>
</tr>
<tr>
<td>Timberland No. 3</td>
<td>70-79</td>
<td>1.00</td>
<td>20.00</td>
<td>20.00</td>
<td>5.00</td>
<td>15.00</td>
<td>0.1000</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural (75 Avg.)</td>
<td>1.10</td>
<td>x</td>
<td>20.00 = 22.00</td>
<td>5.00 = 16.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$160</td>
</tr>
<tr>
<td>Timberland No. 4</td>
<td>60-69</td>
<td>0.75</td>
<td>20.00</td>
<td>15.00</td>
<td>5.00</td>
<td>10.00</td>
<td>0.1000</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural (65 Avg.)</td>
<td>0.75</td>
<td>x</td>
<td>20.00 = 11.00</td>
<td>5.00 = 6.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$100</td>
</tr>
<tr>
<td>Timberland No. 5</td>
<td>50-59</td>
<td>0.55</td>
<td>20.00</td>
<td>11.00</td>
<td>5.00</td>
<td>6.00</td>
<td>0.1000</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural (55 Avg.)</td>
<td>0.55</td>
<td>x</td>
<td>20.00 = 6.00</td>
<td>5.00 = 1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$60</td>
</tr>
<tr>
<td>Planted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$60</td>
</tr>
</tbody>
</table>

* * Includes annualized plantation establishment costs.
** ** Slash Pine at age 30 years.

### NON - PINE

**Hardwood**

<table>
<thead>
<tr>
<th></th>
<th>Management Cost per Acre</th>
<th>Classified by percentage of value for Slash Pine site index.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardwood or Pine-Hardwood mixtures on sites subject to stand conversion; high hammocks.</td>
<td>$45 per acre as calculated from Table 5, Woodlands Section, Classified Use Agricultural Guidelines.</td>
<td></td>
</tr>
</tbody>
</table>

**Swamp**

Stream and river bottoms that flood, stream margins, bays, Cypress ponds, Swamps.

**Non-Productive**

Permanent open sogs; permanent open water; borrow pits; highway, pipe, and powerline rights-of-way; salt water marsh; spoil, dumps, and pits.

P.A. value for Non-Productive (<= $30)
Tax Comparison: Market Value vs Greenbelt Value

Market Value per Acre: $8,000

County Millage Rate: 0.002 (20)

Net Income per Acre: $20

Market Value Taxes per Acre: $160

Greenbelt Value per Acre: $200 (w/.10 Cap Rate)

Greenbelt Value Taxes per Acre: $4
APPLICATION PROCESS

Forms and deadlines

Avoid costly mistakes

Requests for supporting documentation
Section 193.461
The undersigned, hereby request that the lands listed hereon, where appropriate, be classified as Agricultural Lands for property tax purposes, by the property appraiser of the county in which the lands are located.

This form must be signed and both copies returned on or before March 1st.

Applicant’s Name and Address:  

Return To:  

Telephone No. (   )  

Legal Description  

Property I.D. Number  

<table>
<thead>
<tr>
<th>Lands used primarily for agricultural purposes are as follows:</th>
<th>How Long in this use?</th>
<th>Agricultural income from this property (Please complete for the past four (4) Years).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrus)(((Citrus)))</td>
<td>Acres</td>
<td>Yrs.</td>
</tr>
<tr>
<td>Cropland</td>
<td>Acres</td>
<td>Yrs.</td>
</tr>
<tr>
<td>Grazing Land</td>
<td>Acres</td>
<td>Yrs.</td>
</tr>
<tr>
<td>No. of Livestock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timberland</td>
<td>Acres</td>
<td>Yrs.</td>
</tr>
<tr>
<td>Poultry, Swine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or Beeyards</td>
<td>Acres</td>
<td>Yrs.</td>
</tr>
<tr>
<td>Other</td>
<td>Acres</td>
<td>Yrs.</td>
</tr>
</tbody>
</table>

Has a Tangible Personal Property Tax Return been filed with the County Property Appraiser for machinery and equipment?  
Yes ☐  No ☐  If yes, what name was the Tangible Return filed under?  

Is the real property leased to others?  
Yes ☐  No ☐  If Yes, attach copy of Lease Agreement.  

Has the real property been zoned to a nonagricultural use at the request of the owner?  
Yes ☐  No ☐  

As of January 1st of this year, ______ the lands listed above were used primarily for "Bona Fide" Agricultural Purposes. Bona Fide Agricultural Purpose means "Good Faith Commercial Agricultural use of the Land."

I understand that the property appraiser may require supplemental and additional information, other than the application, and I am willing to comply with any reasonable request to furnish such information.

Under penalties of perjury, I declare that I have read the foregoing application and that the facts stated in it are true. If prepared by someone other than the applicant, his/her declaration is based on all information of which he/she has any knowledge.

Signature:  
Date:  

For Record Purposes Only  
This acknowledges receipt of your Application for Agricultural Classification of Lands on ______ for the above described property.

Property Appraiser:  
County  
(date)

Record of Action of County Property Appraiser  
(Check Only the Appropriate Box Below)

1. Application approved and all lands are classified Agricultural ☐
2. Application disapproved and Agricultural Classification of Lands denied on all Lands ☐
3. Application ☐ approved in part, and ☐ disapproved in part  
Agricultural Classification of Lands approved on the following described portion (Use this space only if item 3 above is checked)  

Property Appraiser:  
Date:  

---
## Property Control No.

### Renewal Application For

<table>
<thead>
<tr>
<th>Do you own Tangible Personal Property used in connection with the herein described property?</th>
<th>☐ Yes ☐ No</th>
</tr>
</thead>
<tbody>
<tr>
<td>If yes, do you intend to file a Personal Property Return with the Property Appraiser this year?</td>
<td>☐ Yes ☐ No</td>
</tr>
</tbody>
</table>

### Name and Address of Property Owner

### Legal Description

I hereby apply for Agricultural or High-Water Recharge Classification of lands as listed on the card. As of January 1, of the year indicated on this card, the lands were primarily used for commercial agricultural purposes. I have examined all information printed on this card and hereby certify that it is correct.

X Signature

Date:

---

**Instructions - Read Carefully**

If property description, use of the land, acreage, etc. is correct as listed on this card, sign and date below; then bring or mail this card immediately to the Property Appraiser’s Office. You will then be sent a receipt.

If any information is incorrect or if the use of the land has changed since last year, contact the Property Appraiser's Office immediately.

---

**Be sure to complete & sign below.**

**Please complete the information below**

The property herein described was on January 1st being used for a bona fide Agricultural or High-Water Recharge purpose.

- ☐ Pasture
- ☐ High-water Recharge
- ☐ Citrus
- ☐ Forestry
- ☐ Row Crop
- ☐ Other
- ☐ Used By Owner ☐ By Lessee

If used by Lessee, Name

and Address of Lessee

---

Has property been rezoned to non-agricultural use at the request of owner? ☐ Yes ☐ No

**Detach this card, affix postage on reverse side, mail before March 1.**

---

**IMPORTANT! AGRICULTURAL OR HIGH-WATER RECHARGE RENEWAL**
REMOVAL OF AGRICULTURAL OR HIGH-WATER RECHARGE CLASSIFICATION

☐ I no longer qualify for (check one) ☐ Agricultural ☐ High-Water Recharge Classification of Lands as of January 1, of the year indicated on this card. The lands were not being used primarily for bona fide Agricultural or High-Water Recharge purposes.

WARNING

It is unlawful to give false information for the purpose of continuing the Agricultural or High-Water Recharge Classification of Lands.

Please remove the above Agricultural or High-Water Recharge Classification of Lands from my property.

________________________________________  ____________________________
Signature                                      Date

RETURN SERVICE REQUESTED
RECEIPT FOR AGRICULTURAL OR HIGH-WATER RECHARGE CLASSIFICATION RENEWAL

<table>
<thead>
<tr>
<th>Legal Description</th>
<th>Property Control No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
If no longer qualified for the Agricultural or High-Water Recharge Classification, detach above card, check appropriate box, affix postage and mail before March 1.

AGRICULTURAL OR HIGH-WATER RECHARGE CLASSIFICATION RECEIPT

Your Agricultural or High-Water Recharge Classification Application for this tax year is being automatically renewed. This is your receipt.

If you are no longer entitled to the Agricultural or High-Water Recharge Classification, you must sign on the reverse side of this document and return it to the Property Appraiser.

If any information is incorrect or if the use of the land has changed since last year, you are required to contact the Property Appraiser’s Office.

You are no longer eligible for Agricultural or High-Water Recharge Classification if the lands are not being used primarily for bona fide Agricultural or High-Water Recharge purposes.

If you are applying for Agricultural or High-Water Recharge Classification on new property or for any exemption for the first time, you must apply at the Property Appraiser’s Office on or before March 1st of this year. You will be notified by the Property Appraiser on or before July 1 of this year if your application is rejected.

If you have any questions concerning exemptions or this form, call your County Property Appraiser.
DENIALS AND APPEALS

Forms and requirements

Value Adjustment Board
Notice of Denial of Application for Agricultural or High-Water Recharge Classification of Lands

TO:  

DATE:

The lands described below do not qualify as agricultural or high-water recharge lands for property tax purposes. Your application is being denied for the following reasons:

This decision can be appealed to the Value Adjustment Board. You must file a petition with the clerk of the Board of County Commissioners of this county. The petition must be filed by the 30th day following the mailing of this notice. (Section 194.011(3) (d) F.S.). If you fail to file a petition within the time allowed by law, you will impair your right to appeal this decision. Petition forms are available in this office.

Sincerely,  

Property Appraiser


County, Florida

CLERK - WHITE    APPRAISER - CANARY    TAXPAYER - PINK
Petition to Value Adjustment Board

To the Value Adjustment Board in and for ___________________________ County, Florida.

Section I

I, the undersigned petitioner, whose name and address is: ________________________________

Hereby petition the Value Adjustment Board for the following purpose or purposes indicated by a check mark in the appropriate box.

☐ 1. Seeking review and adjustment of the Market or Classified Use Value of the following described real property.
☐ 2. Appeal of disapproval for Ad Valorem Tax exemption including denial of homestead exemption, by the property appraiser.
☐ 3. Appeal of the disapproval of application for Agricultural or High-Water Recharge Classification. (Please attach copy of original application.)
☐ 4. Appeal of late filing application of Homestead Exemption for extenuating circumstances pursuant to Section 196.011(8), Florida Statutes (F.S.).
☐ 5. Appeal of late filing application of Agricultural Classification for extenuating circumstances pursuant to 193.461(3)(a), Florida Statutes (F.S.).

The market value on my property is $ ___________________________

My estimate of the market value of the property as of January 1st of this year is $ ___________________________.

The appraiser’s parcel number is _________________________________.

Description of property: _________________________________.

The approximate time anticipated by the petitioner to present and argue this petition is ________________ hours ________________ minutes. Indicate any date(s) when you would not be available for a hearing:

Notice: No petitioner shall present, nor shall the board of special master accept, testimony or other evidentiary materials for consideration that were requested of the petitioner in writing by the property appraiser of which the petitioner had knowledge and denied to the property appraiser.

Section II

I submit the following information in support of this petition. Include the name of the owner, the market value and a description of any property adjacent to or of like nature, use and location with which a comparison will show discrimination or inequity to the property described above. (If the comparable property has a value that is lower than market value, the Board has no authority to lower the value of the property described above based solely on the comparable property.)

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________

(Attach an extra sheet if necessary.)

I request that a copy of the property record card be furnished with the notice of scheduled time of appearance before the Value Adjustment Board. Yes ☐ No ☐
Section III
Real Property
Complete this section only if purpose number 1 or 3 in Section I is checked.

Property described in Section I is used as follows:

- Residential
- Apartment Building
- Duplex
- Hotel
- Store
- Office
- Shopping Center
- Agricultural
- Industrial
- Motel
- Other
- Vacant

Did you purchase land and building? ____________ Total price $ ____________
Date purchased ______________________________ Total cost of building $ ____________
Cost of land $ ____________ Cost of improvements after purchase $ ____________
Date Built ______________________________ Mortgage (if any) in amount of $ ____________
Date of Mortgage ______________________________ Balance Due $ ____________
Amount of Insurance $ ____________ Age of Building ____________
Is property rented or leased? Yes No
If yes, Net Income $ ____________ Gross Income $ ____________
Is property agricultural? Yes No
Type of agricultural use ____________
Total acreage ____________ Acreage under agricultural use ____________
Professional appraiser's report of value (if available) $ ____________

Section IV

I am willing to submit any additional information pertinent to this petition. Yes No
Have you discussed this assessment with the property appraiser prior to filing this petition? Yes No
If "No", was a conference requested? Yes No

State of Florida
County of ________________________________

Before me, the undersigned authority, personally appeared ________________________________
who in my presence subscribed the foregoing petition and who after having been duly sworn deposed and said that he or she is the
owner of the property described in Section I of the foregoing petition, that the above and foregoing statements of matters, facts,
values and any exhibits attached are true and correct.

[Signature of Petitioner]

Sworn to (or affirmed) and subscribed before me this ____________ day of ________________________________
by ________________________________ .
[Name of Petitioner]

Personally Known __________________
OR Produced Identification __________________
Type of Identification Produced __________________

Print, Type or Stamp Commissioned Name of Notary ________________________________
Signature of Notary ________________________________

Receipt

I hereby certify that the foregoing petition to the Value Adjustment Board was filed with the undersigned as the clerk of the governing
body of this county on the ____________ day of ________________________________ (a.m., p.m.) and the signing and delivery
of a copy by me to the petitioner constitutes a receipt of the same. I further certify that a copy of the foregoing petition was furnished
by me to the property appraiser of this county on the ____________ day of ________________________________ .

______________________________
County Clerk

White - clerk's copy  Yellow - appraiser copy  Pink - petitioner copy
Excerpts from the Florida Statutes

194.011 Assessment Notice; Objections to Assessments

(1) Each taxpayer whose property is subject to real or tangible personal ad valorem taxes shall be notified of the assessment of each taxable item of such property, as provided in s. 200.089.

(2) Any taxpayer who objects to the assessment placed on any property taxable to him may request the property appraiser to informally confer with the taxpayer. Upon receiving the request, the property appraiser, or a member of his staff, shall confer with the taxpayer regarding the correctness of the assessment. At this informal conference, the taxpayer shall present those facts considered by the taxpayer to be supportive of the taxpayer's claim for a change in the assessment of the property appraiser. The property appraiser or his representative at this conference shall present those facts considered by the property appraiser to be supportive of the correctness of the assessment. However, nothing herein shall be construed to be a prerequisite to administrative or judicial review of property assessments.

(3) A petition to the Value Adjustment Board shall describe the property by parcel number and shall be filed as follows:

(a) The property appraiser shall have available and shall distribute forms prescribed by the Department of Revenue on which the petition shall be made. Such petition shall be sworn to by the petitioner.

(b) The completed petition shall be filed with the clerk of the Value Adjustment Board of the county, who shall acknowledge receipt thereof and promptly furnish a copy thereof to the property appraiser.

(c) The petition shall state the approximate time anticipated by the taxpayer to present and argue his petition before the board.

(d) The petition may be filed, as to valuation issues, at any time during the taxable year on or before the 25th day following the mailing of notice by the property appraiser as provided in subsection (1). With respect to an issue involving the denial of an exemption, an agricultural classification application, or a deferral, the petition shall be filed at any time during the taxable year on or before the 30th day following the mailing of the notice by the property appraiser under s.193.461 or s.196.193 or notice by the tax collector under s.197.253.

(e) A condominium association, cooperative association, or homeowners’ association as defined in s. 723.075, with approval of its board of administration or directors, may file with the Value Adjustment Board a single joint petition on behalf of any association members who own parcels of property which the property appraiser determines are substantially similar with respect to location, proximity to amenities, number of rooms, living area, and condition. The condominium association, cooperative association, or homeowners’ association as defined in s. 723.075 shall provide the unit owners with notice of its intent to petition the Value Adjustment Board and shall provide at least 20 days for a unit owner to elect, in writing, that his unit not be included in the petition.

(f) An owner of contiguous, undeveloped parcels may file with the Value Adjustment Board a single joint petition if the property appraiser determines such parcels are substantially similar in nature.

(g) The individual, agent, or legal entity that signs the petition becomes an agent of the taxpayer for the purpose of serving process to obtain personal jurisdiction over the taxpayer for the entire Value Adjustment Board proceedings, including any appeals of a board decision by the property appraiser pursuant to s. 194.036.

Instructions

Sections I & II - The petitioner is required to complete these two sections.

Section III - The petitioner is required to complete this section if his petition pertains to Real Property or Agricultural Classification.

Section IV - This section is to be sworn to by the petitioner in the presence of a notary public. The receipt part of this section will be completed by the County Clerk or the Clerk of the governing body of the county when your petition is filed.
GREENBELT QUALIFICATIONS, REQUIREMENTS, AND RECENT CHANGES TO THE REQUIREMENTS

Primary use

Commercial use

Important qualifying criteria for timberland

~Length of use

~Continuous use

~Size

~Conditions and efforts

~Purchase price

Statutory change to Size factor
193.461 Agricultural lands; classification and assessment; mandated eradication or quarantine program. --

(1) The property appraiser shall, on an annual basis, classify for assessment purposes all lands within the county as either agricultural or nonagricultural.

(2) Any landowner whose land is denied agricultural classification by the property appraiser may appeal to the value adjustment board. The property appraiser shall notify the landowner in writing of the denial of agricultural classification on or before July 1 of the year for which the application was filed. The notification shall advise the landowner of his or her right to appeal to the value adjustment board and of the filing deadline. The board may also review all lands classified by the property appraiser upon its own motion. The property appraiser shall have available at his or her office a list by ownership of all applications received showing the acreage, the full valuation under s. 193.011, the valuation of the land under the provisions of this section, and whether or not the classification requested was granted.

(3)(a) No lands shall be classified as agricultural lands unless a return is filed on or before March 1 of each year. The property appraiser, before so classifying such lands, may require the taxpayer or the taxpayer's representative to furnish the property appraiser such information as may reasonably be required to establish that such lands were actually used for a bona fide agricultural purpose. Failure to make timely application by March 1 shall constitute a waiver for 1 year of the privilege herein granted for agricultural assessment. However, an applicant who is qualified to receive an agricultural classification who fails to file an application by March 1 may file an application for the classification and may file, pursuant to s. 194.011(3), a petition with the value adjustment board requesting that the classification be granted. The petition may be filed at any time during the taxable year on or before the 25th day following the mailing of the notice by the property appraiser as provided in s. 194.011 (1). Notwithstanding the provisions of s. 194.013, the applicant must pay a nonrefundable fee of $15 upon filing the petition. Upon reviewing the petition, if the person is qualified to receive the classification and demonstrates particular extenuating circumstances judged by the property appraiser or the value adjustment board to warrant granting the classification, the property appraiser or the value adjustment board may grant the classification. The owner of land that was classified agricultural in the previous year and whose ownership or use has not changed may reapply on a short form as provided by the department. The lessee of property may make original application or reapply using the short form if the lease, or an affidavit executed by the owner, provides that the lessee is empowered to make application for the agricultural classification on behalf of the owner and a copy of the lease or affidavit accompanies the application. A county may, at the request of the property appraiser and by a majority vote of its governing body, waive the requirement that an annual application or statement be made for classification of property within the county after an initial application is made and the classification granted by the property appraiser. Such waiver may be revoked by a majority vote of the governing body of the county.
(b) Subject to the restrictions set out in this section, only lands which are used primarily for bona fide agricultural purposes shall be classified agricultural. "Bona fide agricultural purposes" means good faith commercial agricultural use of the land. In determining whether the use of the land for agricultural purposes is bona fide, the following factors may be taken into consideration:

1. The length of time the land has been so utilized;
2. Whether the use has been continuous;
3. The purchase price paid;
4. Size, as it relates to specific agricultural use;
5. Whether an indicated effort has been made to care sufficiently and adequately for the land in accordance with accepted commercial agricultural practices, including, without limitation, fertilizing, liming, tilling, mowing, reforesting, and other accepted agricultural practices;
6. Whether such land is under lease and, if so, the effective length, terms, and conditions of the lease; and
7. Such other factors as may from time to time become applicable.

(c) The maintenance of a dwelling on part of the lands used for agricultural purposes shall not in itself preclude an agricultural classification.

(d) When property receiving an agricultural classification contains a residence under the same ownership, the portion of the property consisting of the residence and curtilage must be assessed separately, pursuant to s. 193.011, to qualify for the assessment limitation set forth in s. 193.155. The remaining property may be classified under the provisions of paragraphs (a) and (b).

(e) Notwithstanding the provisions of paragraph (a), land that has received an agricultural classification from the value adjustment board or a court of competent jurisdiction pursuant to this section is entitled to receive such classification in any subsequent year until such agricultural use of the land is abandoned or discontinued, the land is diverted to a nonagricultural use, or the land is reclassified as nonagricultural pursuant to subsection (4). The property appraiser must, no later than January 31 of each year, provide notice to the owner of land that was classified agricultural in the previous year informing the owner of the requirements of this paragraph and requiring the owner to certify that neither the ownership nor the use of the land has changed. The department shall, by administrative rule, prescribe the form of the notice to be used by the property appraiser under this paragraph. If a county has waived the requirement that an annual application or statement be made for classification of property pursuant to paragraph (a), the county may, by a majority vote of its governing body, waive the notice and certification requirements of this paragraph and shall provide the property owner with the same notification provided to owners of land granted an agricultural classification by the property appraiser. Such waiver may be revoked by a majority vote of the county's governing body. This paragraph does not apply to any property if the agricultural classification of that property is the subject of current litigation.

(4)(a) The property appraiser shall reclassify the following lands as nonagricultural:
1. Land diverted from an agricultural to a nonagricultural use.

2. Land no longer being utilized for agricultural purposes.

3. Land that has been zoned to a nonagricultural use at the request of the owner subsequent to the enactment of this law.

(b) The board of county commissioners may also reclassify lands classified as agricultural to nonagricultural when there is contiguous urban or metropolitan development and the board of county commissioners finds that the continued use of such lands for agricultural purposes will act as a deterrent to the timely and orderly expansion of the community.

(c) Sale of land for a purchase price which is three or more times the agricultural assessment placed on the land shall create a presumption that such land is not used primarily for bona fide agricultural purposes. Upon a showing of special circumstances by the landowner demonstrating that the land is to be continued in bona fide agriculture, this presumption may be rebutted.

(5) For the purpose of this section, "agricultural purposes" includes, but is not limited to, horticulture; floriculture; viticulture; forestry; dairy; livestock; poultry; bee; pisciculture, when the land is used principally for the production of tropical fish; aquaculture; sod farming; and all forms of farm products and farm production.

(6)(a) In years in which proper application for agricultural assessment has been made and granted pursuant to this section, the assessment of land shall be based solely on its agricultural use. The property appraiser shall consider the following use factors only:

1. The quantity and size of the property;

2. The condition of the property;

3. The present market value of the property as agricultural land;

4. The income produced by the property;

5. The productivity of land in its present use;

6. The economic merchantability of the agricultural product; and

7. Such other agricultural factors as may from time to time become applicable, which are reflective of the standard present practices of agricultural use and production.

(b) Notwithstanding any provision relating to annual assessment found in s. 192.042, the property appraiser shall rely on 5-year moving average data when utilizing the income methodology approach in an assessment of property used for agricultural purposes.

(c)1. For purposes of the income methodology approach to assessment of property used for agricultural purposes, irrigation systems, including pumps and motors, physically attached to the land shall be considered a part of the average yields per acre and shall have no separately assessable contributory value.
2. Litter containment structures located on producing poultry farms and animal waste nutrient containment structures located on producing dairy farms shall be assessed by the methodology described in subparagraph 1.

(d) In years in which proper application for agricultural assessment has not been made, the land shall be assessed under the provisions of s. 193.011.

(7) Lands classified for assessment purposes as agricultural lands which are taken out of production by any state or federal eradication or quarantine program shall continue to be classified as agricultural lands for the duration of such program or successor programs. Lands under these programs which are converted to fallow, or otherwise nonincome-producing uses shall continue to be classified as agricultural lands and shall be assessed at a de minimis value of no more than $50 per acre, on a single year assessment methodology; however, lands converted to other income-producing agricultural uses permissible under such programs shall be assessed pursuant to this section. Land under a mandated eradication or quarantine program which is diverted from an agricultural to a nonagricultural use shall be assessed under s. 193.011.

History.—s. 1, ch. 59-226; s. 1, ch. 67-117; ss. 1, 2, ch. 69-55; s. 1, ch. 72-181; s. 4, ch. 74-234; s. 3, ch. 76-133; s. 15, ch. 82-208; ss. 10, 80, ch. 82-226; s. 1, ch. 85-77; s. 3, ch. 86-300; s. 23, ch. 90-217; ss. 132, 142, ch. 91-112; s. 63, ch. 94-353; s. 1468, ch. 95-147; s. 1, ch. 95-404; s. 1, ch. 98-313; s. 1, ch. 99-351; s. 3, ch. 2000-308; s. 4, ch. 2001-279; s. 15, ch. 2002-18; s. 2, ch. 2003-162; s. 43, ch. 2003-254; s. 1, ch. 2006-45.
OTHER QUALIFICATION ISSUES

Non-use and conversion

Re-zoning to a non-agricultural use
ADDITIONAL GREENBELT COMMENTS
# SLASH PLANTATION AD VALOREM TAX COMPARISON: FLORIDA - GEORGIA

(---January 1 in Year 11 of Ownership---)
Slash Pine Plantation, Age 5 through Age 15

**Assumptions:**
- Agricultural assessments fixed for 10 years; property purchased at age 5
- Millage rates fixed for 10 years
- Florida county millage 18; Georgia county millage 35
- Georgia assessment 40% x CUVA; Florida assessment 100% x Greenbelt
- Florida assessment $200 per acre; Georgia assessment $499 per acre (Ga DOR)
- Thinned in December at Age 15, 10 cords per acre, $18 per cord
- Site index (50) 90
- Rate = 4%

<table>
<thead>
<tr>
<th></th>
<th>Florida</th>
<th>Georgia</th>
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</thead>
<tbody>
<tr>
<td>Year 1 property tax</td>
<td>$ 3.60</td>
<td>$ 6.99</td>
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<tr>
<td>10 year cumulative</td>
<td>$ 43.22</td>
<td>$ 83.92</td>
</tr>
<tr>
<td>Timber tax, thinning</td>
<td>N/A</td>
<td>$ 6.30</td>
</tr>
<tr>
<td>Total Tax Liability</td>
<td>$ 43.22</td>
<td>$ 90.22</td>
</tr>
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Resolution of the Taxation and Budget Reform Commission
A resolution proposing an amendment to Sections 3 and 4 of
Article VII and the creation of Section 28 of Article XII
of the State Constitution to require the Legislature to
provide by law for an ad valorem tax exemption for real
property dedicated in perpetuity for conservation
purposes, to require land used for conservation purposes
to be classified and assessed solely on the basis of
character or use for the purposes of ad valorem taxation,
and to provide implementation and effective dates.

Be It Resolved by the Taxation and Budget Reform Commission:

That the following amendment to Sections 3 and 4 of Article
VII and the creation of Section 28 of Article XII of the State
Constitution are agreed to and shall be submitted to the
electors of this state for approval or rejection at the next
general election or at an earlier special election specifically
authorized by law for that purpose:

ARTICLE VII
FINANCE AND TAXATION

SECTION 3. Taxes; exemptions.--
(a) All property owned by a municipality and used
exclusively by it for municipal or public purposes shall be
exempt from taxation. A municipality, owning property outside
the municipality, may be required by general law to make payment
to the taxing unit in which the property is located. Such
portions of property as are used predominantly for educational,
the electors of the county or municipality, and may be renewable by referendum as provided by general law.

(d) By general law and subject to conditions specified therein, there may be granted an ad valorem tax exemption to a renewable energy source device and to real property on which such device is installed and operated, to the value fixed by general law not to exceed the original cost of the device, and for the period of time fixed by general law not to exceed ten years.

(e) Any county or municipality may, for the purpose of its respective tax levy and subject to the provisions of this subsection and general law, grant historic preservation ad valorem tax exemptions to owners of historic properties. This exemption may be granted only by ordinance of the county or municipality. The amount or limits of the amount of this exemption and the requirements for eligible properties must be specified by general law. The period of time for which this exemption may be granted to a property owner shall be determined by general law.

(f) By general law and subject to conditions specified therein, twenty-five thousand dollars of the assessed value of property subject to tangible personal property tax shall be exempt from ad valorem taxation.

(g) There shall be granted an ad valorem tax exemption for real property dedicated in perpetuity for conservation purposes, including real property encumbered by perpetual conservation easements or by other perpetual conservation protections, as defined by general law.
SECTION 4. Taxation; assessments.--By general law regulations shall be prescribed which shall secure a just valuation of all property for ad valorem taxation, provided:

(a) Agricultural land, land producing high water recharge to Florida's aquifers, or land used exclusively for noncommercial recreational purposes may be classified by general law and assessed solely on the basis of character or use.

(b) As provided by general law and subject to conditions, limitations, and reasonable definitions specified therein, land used for conservation purposes shall be classified by general law and assessed solely on the basis of character or use.

(c) Pursuant to general law tangible personal property held for sale as stock in trade and livestock may be valued for taxation at a specified percentage of its value, may be classified for tax purposes, or may be exempted from taxation.

(d) All persons entitled to a homestead exemption under Section 6 of this Article shall have their homestead assessed at just value as of January 1 of the year following the effective date of this amendment. This assessment shall change only as provided herein.

(1) Assessments subject to this provision shall be changed annually on January 1st of each year; but those changes in assessments shall not exceed the lower of the following:

   a. Three percent (3%) of the assessment for the prior year.

   b. The percent change in the Consumer Price Index for all urban consumers, U.S. City Average, all items 1967=100, or successor reports for the preceding calendar year as initially
qualifying improvement, as defined by general law, is made to such property. Thereafter, such property shall be assessed as provided in this subsection.

(4) The legislature may provide that such property shall be assessed at just value as of the next assessment date after a change of ownership or control, as defined by general law, including any change of ownership of the legal entity that owns the property. Thereafter, such property shall be assessed as provided in this subsection.

(5) Changes, additions, reductions, or improvements to such property shall be assessed as provided for by general law; however, after the adjustment for any change, addition, reduction, or improvement, the property shall be assessed as provided in this subsection.

ARTICLE XII

SCHEDULE

SECTION 28. Property tax exemption and classification and assessment of land used for conservation purposes. The amendment to Section 3 of Article VII requiring the creation of an ad valorem tax exemption for real property dedicated in perpetuity for conservation purposes, and the amendment to Section 4 of Article VII requiring land used for conservation purposes to be classified by general law and assessed solely on the basis of character or use for purposes of ad valorem taxation, shall take effect upon approval by the electors and shall be implemented by January 1, 2010. This section shall take effect upon approval of the electors.
BE IT FURTHER RESOLVED that the following statement be placed on the ballot:

CONSTITUTIONAL AMENDMENT

ARTICLE VII, SECTIONS 3 AND 4
ARTICLE XII, SECTION 28

PROPERTY TAX EXEMPTION OF PERPETUALLY CONSERVED LAND;
CLASSIFICATION AND ASSESSMENT OF LAND USED FOR CONSERVATION.--

Requires Legislature to provide a property tax exemption for real property encumbered by perpetual conservation easements or other perpetual conservation protections, defined by general law. Requires Legislature to provide for classification and assessment of land used for conservation purposes, and not perpetually encumbered, solely on the basis of character or use. Subjects assessment benefit to conditions, limitations, and reasonable definitions established by general law. Applies to property taxes beginning in 2010.
704.06 Conservation easements; creation; acquisition; enforcement.--

(1) As used in this section, "conservation easement" means a right or interest in real property which is appropriate to retaining land or water areas predominantly in their natural, scenic, open, agricultural, or wooded condition; retaining such areas as suitable habitat for fish, plants, or wildlife; retaining the structural integrity or physical appearance of sites or properties of historical, architectural, archaeological, or cultural significance; or maintaining existing land uses and which prohibits or limits any or all of the following:

(a) Construction or placing of buildings, roads, signs, billboards or other advertising, utilities, or other structures on or above the ground.

(b) Dumping or placing of soil or other substance or material as landfill or dumping or placing of trash, waste, or unsightly or offensive materials.

(c) Removal or destruction of trees, shrubs, or other vegetation.

(d) Excavation, dredging, or removal of loam, peat, gravel, soil, rock, or other material substance in such manner as to affect the surface.

(e) Surface use except for purposes that permit the land or water area to remain predominantly in its natural condition.

(f) Activities detrimental to drainage, flood control, water conservation, erosion control, soil conservation, or fish and wildlife habitat preservation.

(g) Acts or uses detrimental to such retention of land or water areas.

(h) Acts or uses detrimental to the preservation of the structural integrity or physical appearance of sites or properties of historical, architectural, archaeological, or cultural significance.

(2) Conservation easements are perpetual, undivided interests in property and may be created or stated in the form of a restriction, easement, covenant, or condition in any deed, will, or other instrument executed by or on behalf of the owner of the property, or in any order of taking. Such easements may be acquired in the same manner as other interests in property are acquired, except by condemnation or
by other exercise of the power of eminent domain, and shall not be unassignable to other governmental bodies or agencies, charitable organizations, or trusts authorized to acquire such easements, for lack of benefit to a dominant estate.

(3) Conservation easements may be acquired by any governmental body or agency or by a charitable corporation or trust whose purposes include protecting natural, scenic, or open space values of real property, assuring its availability for agricultural, forest, recreational, or open space use, protecting natural resources, maintaining or enhancing air or water quality, or preserving sites or properties of historical, architectural, archaeological, or cultural significance.

(4) Conservation easements shall run with the land and be binding on all subsequent owners of the servient estate. Notwithstanding the provisions of s. 197.552, all provisions of a conservation easement shall survive and are enforceable after the issuance of a tax deed. No conservation easement shall be unenforceable on account of lack of privity of contract or lack of benefit to particular land or on account of the benefit being assignable. Conservation easements may be enforced by injunction or proceeding in equity or at law, and shall entitle the holder to enter the land in a reasonable manner and at reasonable times to assure compliance. A conservation easement may be released by the holder of the easement to the holder of the fee even though the holder of the fee may not be a governmental body or a charitable corporation or trust.

(5) All conservation easements shall be recorded and indexed in the same manner as any other instrument affecting the title to real property.

(6) The provisions of this section shall not be construed to imply that any restriction, easement, covenant, or condition which does not have the benefit of this section shall, on account of any provision hereof, be unenforceable.

(7) Recording of the conservation easement shall be notice to the property appraiser and tax collector of the county of the conveyance of the conservation easement.

(8) Conservation easements may provide for a third-party right of enforcement. As used in this section, third-party right of enforcement means a right provided in a conservation easement to enforce any of its terms granted to a governmental body, or charitable corporation or trust as described in subsection (3), which although eligible to be a holder, is not a holder.

(9) An action affecting a conservation easement may be brought by:

(a) An owner of an interest in the real property burdened by the easement;

(b) A holder of the easement;

(c) A person having a third-party right of enforcement; or

(d) A person authorized by another law.
(10) The ownership or attempted enforcement of rights held by the holder of an easement does not subject the holder to any liability for any damage or injury that may be suffered by any person on the property or as a result of the condition of the property encumbered by a conservation easement.

(11) Nothing in this section or other provisions of law shall be construed to prohibit or limit the owner of land, or the owner of a conservation easement over land, to voluntarily negotiate the sale or utilization of such lands or easement for the construction and operation of linear facilities, including electric transmission and distribution facilities, telecommunications transmission and distribution facilities, pipeline transmission and distribution facilities, public transportation corridors, and related appurtenances, nor shall this section prohibit the use of eminent domain for said purposes as established by law. In any legal proceeding to condemn land for the purpose of construction and operation of a linear facility as described above, the court shall consider the public benefit provided by the conservation easement and linear facilities in determining which lands may be taken and the compensation paid.

History.--s. 1, ch. 76-169; s. 1, ch. 86-44; s. 74, ch. 93-206; s. 17, ch. 97-164; s. 7, ch. 2007-204.
193.501 Assessment of lands subject to a conservation easement, environmentally endangered lands, or lands used for outdoor recreational or park purposes when land development rights have been conveyed or conservation restrictions have been covenanted. —

(1) The owner or owners in fee of any land subject to a conservation easement as described in s. 704.06(1); land qualified as environmentally endangered pursuant to paragraph (6)(i) and so designated by formal resolution of the governing board of the municipality or county within which such land is located; land designated as conservation land in a comprehensive plan adopted by the appropriate municipal or county governing body; or any land which is utilized for outdoor recreational or park purposes may, by appropriate instrument, for a term of not less than 10 years:

(a) Convey the development right of such land to the governing board of any public agency in this state within which the land is located, or to the Board of Trustees of the Internal Improvement Trust Fund, or to a charitable corporation or trust as described in s. 704.06(3); or

(b) Covenant with the governing board of any public agency in this state within which the land is located, or with the Board of Trustees of the Internal Improvement Trust Fund, or with a charitable corporation or trust as described in s. 704.06(3), that such land be subject to one or more of the conservation restrictions provided in s. 704.06(1) or not be used by the owner for any purpose other than outdoor recreational or park purposes. If land is covenanted and used for an outdoor recreational purpose, the normal use and maintenance of the land for that purpose, consistent with the covenant, shall not be restricted.

(2) The governing board of any public agency in this state, or the Board of Trustees of the Internal Improvement Trust Fund, or a charitable corporation or trust as described in s. 704.06(3), is authorized and empowered in its discretion to accept any and all instruments conveying the development right of any such land or establishing a covenant pursuant to subsection (1), and if accepted by the board or charitable corporation or trust, the instrument shall be promptly filed with the appropriate officer for recording in the same manner as any other instrument affecting the title to real property.

(3) When, pursuant to subsections (1) and (2), the development right in real property has been conveyed to the governing board of any public agency of this state, to the Board of Trustees of the Internal Improvement Trust Fund, or to a charitable corporation or trust as described in s. 704.06(2), or a covenant has been executed and accepted by the board or charitable corporation or trust, the lands which are the subject of such conveyance or covenant shall be thereafter assessed as provided herein:

(a) If the covenant or conveyance extends for a period of not less than 10 years from January 1 in the year such assessment is made, the property appraiser, in valuing such land for tax purposes, shall
consider no factors other than those relative to its value for the present use, as restricted by any conveyance or covenant under this section.

(b) If the covenant or conveyance extends for a period less than 10 years, the land shall be assessed under the provisions of s. 193.011, recognizing the nature and length thereof of any restriction placed on the use of the land under the provisions of subsection (1).

(4) After making a conveyance of the development right or executing a covenant pursuant to this section, or conveying a conservation easement pursuant to this section and s. 704.06, the owner of the land shall not use the land in any manner not consistent with the development right voluntarily conveyed, or with the restrictions voluntarily imposed, or with the terms of the conservation easement or shall not change the use of the land from outdoor recreational or park purposes during the term of such conveyance or covenant without first obtaining a written instrument from the board or charitable corporation or trust, which instrument reconveys all or part of the development right to the owner or releases the owner from the terms of the covenant and which instrument must be promptly recorded in the same manner as any other instrument affecting the title to real property. Upon obtaining approval for reconveyance or release, the reconveyance or release shall be made to the owner upon payment of the deferred tax liability. Any payment of the deferred tax liability shall be payable to the county tax collector within 90 days of the date of approval by the board or charitable corporation or trust of the reconveyance or release. The collector shall distribute the payment to each governmental unit in the proportion that its millage bears to the total millage levied on the parcel for the years in which such conveyance or covenant was in effect.

(5) The governing board of any public agency or the Board of Trustees of the Internal Improvement Trust Fund or a charitable corporation or trust which holds title to a development right pursuant to this section may not convey that development right to anyone other than the governing board of another public agency or a charitable corporation or trust, as described in s. 704.06(3), or the record owner of the fee interest in the land to which the development right attaches. The conveyance from the governing board of a public agency or the Board of Trustees of the Internal Improvement Trust Fund to the owner of the fee shall be made only after a determination by the board that such conveyance would not adversely affect the interest of the public. Section 125.35 does not apply to such sales, but any public agency accepting any instrument conveying a development right pursuant to this section shall forthwith adopt appropriate regulations and procedures governing the disposition of same. These regulations and procedures must provide in part that the board may not convey a development right to the owner of the fee without first holding a public hearing and unless notice of the proposed conveyance and the time and place at which the public hearing is to be held is published once a week for at least 2 weeks in some newspaper of general circulation in the county involved prior to the hearing.

(6) The following terms whenever used as referred to in this section have the following meanings unless a different meaning is clearly indicated by the context:

(a) "Board" is the governing board of any city, county, or other public agency of the state or the Board of Trustees of the Internal Improvement Trust Fund.

(b) "Conservation restriction" means a limitation on a right to the use of land for purposes of conserving or preserving land or water areas predominantly in their natural, scenic, open, agricultural, or wooded condition. The limitation on rights to the use of land may involve or pertain to any of the activities enumerated in s. 704.06(1).
(c) "Conservation easement" means that property right described in s. 704.06.

(d) "Covenant" is a covenant running with the land.

(e) "Deferred tax liability" means an amount equal to the difference between the total amount of taxes that would have been due in March in each of the previous years in which the conveyance or covenant was in effect if the property had been assessed under the provisions of s. 193.011 and the total amount of taxes actually paid in those years when the property was assessed under the provisions of this section, plus interest on that difference computed as provided in s. 212.12(3).

(f) "Development right" is the right of the owner of the fee interest in the land to change the use of the land.

(g) "Outdoor recreational or park purposes" includes, but is not necessarily limited to, boating, golfing, camping, swimming, horseback riding, and archaeological, scenic, or scientific sites and applies only to land which is open to the general public.

(h) "Present use" is the manner in which the land is utilized on January 1 of the year in which the assessment is made.

(i) "Qualified as environmentally endangered" means land that has unique ecological characteristics, rare or limited combinations of geological formations, or features of a rare or limited nature constituting habitat suitable for fish, plants, or wildlife, and which, if subject to a development moratorium or one or more conservation easements or development restrictions appropriate to retaining such land or water areas predominantly in their natural state, would be consistent with the conservation, recreation and open space, and, if applicable, coastal protection elements of the comprehensive plan adopted by formal action of the local governing body pursuant to s. 163.3161, the Local Government Comprehensive Planning and Land Development Regulation Act; or surface waters and wetlands, as determined by the methodology ratified in s. 373.4211.

(7)(a) The property appraiser shall report to the department showing the just value and the classified use value of property that is subject to a conservation easement under s. 704.06, property assessed as environmentally endangered land pursuant to this section, and property assessed as outdoor recreational or park land.

(b) The tax collector shall annually report to the department the amount of deferred tax liability collected pursuant to this section.

History.--s. 1, ch. 67-528; ss. 1, 2, ch. 69-55; s. 2, ch. 72-181; s. 1, ch. 77-102; s. 1, ch. 78-354; s. 2, ch. 84-253; s. 29, ch. 85-55; s. 2, ch. 86-44; s. 39, ch. 93-206; s. 3, ch. 94-122; s. 43, ch. 94-356; s. 9, ch. 2004-349.

Energy Wood
Florida forest biomass: Renewable energy resource

Jarek Nowak, Ph.D.
Florida Division of Forestry

Forest Stewardship Polycom Workshop

Florida
17 June 2008

Questions I will try to answer today:

1. Why are we concerned with producing energy from biomass?
2. What constitutes forest biomass?
3. How much forest biomass is “out there”?
4. Can forest understory biomass be harvested with conventional or specialized equipment?
5. How much electricity or what volume of liquid fuels can be produced from forest biomass?
6. How does this relate to current electricity and liquid fuel consumption in Florida?

Global Carbon Dioxide (CO₂) Emissions

Global Temperature Land-Ocean Index

Temperature Anomaly (°C)


U.S. Gross Petroleum Imports by Source 2005-2030

Dependence on Petroleum Imports was 59.9% in 2006

U.S. Non-Hydro Renewable Electricity Generation

Non-Hydro renewable electricity production was 3.2% in 2005 projected at 4.2% in 2030

Florida Energy Policy

- Florida's Energy Plan, January 2006
- Governor Crist Executive Orders, July 2007:
  - By 2017 reduce GHG emissions to 2000 levels
  - By 2025 reduce GHG emissions to 1990 levels
  - By 2050 reduce GHG emissions to 20% of 1990 levels
  - By September 1, 2007 initiated rule making requiring Florida utilities to produce at least 20% of electricity from renewable sources with a strong focus on solar and wind energy (Renewable Portfolio Standard of 20%)

Florida Electricity Generation in 2005

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MWh</td>
<td>Percent</td>
<td></td>
</tr>
<tr>
<td>Fossil Fuels</td>
<td>1,83,348,709</td>
<td>83.2%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>28,758,826</td>
<td>13.1%</td>
</tr>
<tr>
<td>All Renewable</td>
<td>8,139,215</td>
<td>3.7%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>220,256,411</td>
<td>100%</td>
</tr>
</tbody>
</table>
Renewable Electricity Accounts for 2.1 % of Total Capacity

Energy Source (MW, %)

- Black Liquor, 230.7, 20%
- Landfill Gas, 20.4, 2%
- MSW, 499.8, 44%
- AG Waste, 125.6, 11%
- Waste Heat, 114, 10%
- Wood, 79.5, 7%
- Hydro, 55.7, 5%
- Waste Water, 10, 1%

Source: Tom Hartman, Florida Power and Light Company
Florida Gasoline, Diesel Fuel, and Gasohol Consumption 1983-2006


Diesel and Biodiesel Consumption

Florida biodiesel consumption was about 1% of regular diesel in 2006
Florida ethanol consumption as a gasoline additive was close to 0% in 2006


Quantified versus Not-quantified Forest Biomass Sources

1. **Merchantable timber**, quantified by Forest Inventory and Analysis (FIA) program run by the U.S. Forest Service
2. **Non-merchantable timber**, quantified by FIA (see above)
3. **Logging residues**, quantified in Timber Product Output (TPO) database run by the U.S. Forest Service
4. **Mill residues**, quantified in TPO (see above)
5. **Understory forest biomass** - **Not-quantified**

FIA and TPO databases can be found at: [http://srsfia2.fs.fed.us/](http://srsfia2.fs.fed.us/)
Merchantable Timber 1987-2005

Source: U.S. Forest Service, FIA data, www.ncrs2.fs.fed.us

Florida Pulpwood Harvest Trends

New Pellet Market – Green Circle Bio Energy

Southern Pine Wood Pellets

Non-merchantable Timber

<table>
<thead>
<tr>
<th>Timberland Total (Millions of Green Tons)</th>
<th>Harvestable Biomass ?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>121.9</td>
</tr>
<tr>
<td>Northwest</td>
<td>106.8</td>
</tr>
<tr>
<td>Central</td>
<td>42.7</td>
</tr>
<tr>
<td>South</td>
<td>11.2</td>
</tr>
</tbody>
</table>

Total Florida 282.6  1.9 / Year

Source: U.S. Forest Service, FIA Forest Inventory Mapmaker 2.1
Logging Residues

3.9 Million Green Tons Annually from Tops, Limbs and Stumps

Source: U.S. Forest Service, Timber Products Output Mapmaker 1.0

---

Mill Residues

<table>
<thead>
<tr>
<th>Category</th>
<th>Million Green Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine wood</td>
<td>1.5</td>
</tr>
<tr>
<td>Coarse wood</td>
<td>1.9</td>
</tr>
<tr>
<td>Bark</td>
<td>1.7</td>
</tr>
<tr>
<td>Total Mill Residue</td>
<td>5.1</td>
</tr>
</tbody>
</table>

Unused Mill Residue 0.09%

Source: U.S. Forest Service, Timber Products Output Mapmaker 1.0
Do you hear opportunity knocking???

How can we modify ground-based tree-length southern pine operations to capture harvesting residues and understory biomass without reducing production of roundwood products during thinning or final harvest?


Roundwood and Fuel Chip Harvesting System

Source: Westbrook et al. 2006
Production Rates in Langdale Study

<table>
<thead>
<tr>
<th></th>
<th>Roundwood harvested (Tons / Acre)</th>
<th>Chips harvested (Tons / Acre)</th>
<th>Production rate (Tons/sched Hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundwood only</td>
<td>67.4</td>
<td>0</td>
<td>29.4</td>
</tr>
<tr>
<td>Roundwood + chips from tops and limbs</td>
<td>69.2</td>
<td>3.8</td>
<td>26.0 (1 load of chips per 18 loads of roundwood)</td>
</tr>
<tr>
<td>Roundwood + chips from tops &amp; limbs + chips from understory</td>
<td>60.7</td>
<td>10.8</td>
<td>30.3 (1 load of chips per 5 loads of roundwood)</td>
</tr>
</tbody>
</table>

Source: Westbrook et al. 2006

FOB Pine and Hardwood Chip vs. Delivered Pulpwood Prices

<table>
<thead>
<tr>
<th></th>
<th>1st Qtr 07</th>
<th>2nd Qtr 07</th>
<th>3rd Qtr 07</th>
<th>4th Qtr 07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pine Chips</td>
<td>14.57</td>
<td>16.27</td>
<td>15.50</td>
<td>18.50</td>
</tr>
<tr>
<td>Hdw Chips</td>
<td>15.67</td>
<td>18.08</td>
<td>17.25</td>
<td>18.50</td>
</tr>
<tr>
<td>Pine Pulp</td>
<td>22.87</td>
<td>21.38</td>
<td>22.50</td>
<td>24.09</td>
</tr>
<tr>
<td>Hdw Pulp</td>
<td>21.67</td>
<td>19.19</td>
<td>21.16</td>
<td>22.83</td>
</tr>
</tbody>
</table>

Source: Timber Mart South 2007
Calculated Pine and Hardwood Fuel Chip Stumpage versus TMS Reported Pulpwood Stumpage

<table>
<thead>
<tr>
<th></th>
<th>1st Qtr 07</th>
<th>2nd Qtr 07</th>
<th>3rd Qtr 07</th>
<th>4th Qtr 07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pine Chips</td>
<td>2.06</td>
<td>4.56</td>
<td>3.19</td>
<td>5.16</td>
</tr>
<tr>
<td>Hdw Chips</td>
<td>3.16</td>
<td>6.37</td>
<td>4.94</td>
<td>5.16</td>
</tr>
<tr>
<td>Pine Pulp</td>
<td>8.06</td>
<td>8.07</td>
<td>7.45</td>
<td>7.78</td>
</tr>
<tr>
<td>Hdw Pulp</td>
<td>4.24</td>
<td>5.22</td>
<td>5.87</td>
<td>5.41</td>
</tr>
</tbody>
</table>

Source: Timber Mart South 2007, and Westbrook et al 2006

Osceola National Forest – Dec 11, 07
Understory Biomass Baler in Action
Understory Biomass

- Bottom line we do not know how much is "out there", or how much we could harvest

- Simple calculation:
  0.5 ton x 15.6 million acres = 7.8 million tons

- Let's assume 5 million tons annually as available and harvestable…but this number could be much, much larger.

Summary of Forest Biomass Sources

<table>
<thead>
<tr>
<th>Million Green Tons</th>
<th>Million Green Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulpwood</td>
<td>2.0</td>
</tr>
<tr>
<td>Non-merchantable Timber</td>
<td>1.9</td>
</tr>
<tr>
<td>Logging Residue</td>
<td>3.9</td>
</tr>
<tr>
<td>Understory Biomass</td>
<td>5.0 ? or 25 ??</td>
</tr>
<tr>
<td>Mill Residue</td>
<td>none available</td>
</tr>
</tbody>
</table>

Total with Pulpwood 12.8

Total w/o Pulpwood 10.8

How Much of Extra Electricity from Forest?

1. 9,961,000 BTU in a ton of woody biomass (source: U.S. EIA)
2. 3,412,000 BTU in 1 MWh (Megawatthour) of electricity
3. Assumed conversion efficiency from wood into electricity in a simple combustion of biomass 25%
4. Therefore, 9,961,000 BTU x 0.25 / 3,412,000 BTU per MWh = 0.73 MWh per ton of wood
5. 0.73 MWh x 10,800,000 tons = 7,884,000 MWh of extra electricity from wood, or 3.6% of total consumed in Florida in 2005.
Alternatively…Cellulosic Ethanol

- 50 to 100 gallons of cellulosic ethanol per 1 ton of woody biomass
- 10,800,000 tons of wood x 50 gallons = 540 million gallons of cellulosic ethanol
- 540 million gallons of cellulosic ethanol = 6.3% of Florida gasoline consumption in 2006.

In Conclusion (1)

- Production of electricity or liquid fuels from biomass can reduce U.S. dependence on foreign petroleum imports for energy production, and reduce greenhouse gas emissions contributing to global climate change
- Forest biomass is comprised of merchantable timber, non-merchantable timber, logging residues, mill residues and understory woody vegetation
- The availability of forest biomass in Florida for renewable energy production is approximately 11 million tons annually, excluding pulpwood
- Florida’s forests growing stock volume increased from 1987 to 1995, and again from 1995 to 2005 inventory

In Conclusion (2)

- Florida forests could provide enough biomass to produce either 3.6% of electricity, or cellulosic ethanol equivalent to 6.3% of gasoline consumption in the state
- The conventional pine roundwood harvesting equipment setup is adaptable to understory biomass harvesting and processing by adding an in-woods chipper
- Fuel chip production was profitable in the Georgia thinning study when a load of chips could be produced for every 12 or fewer loads of roundwood
- Florida forest owners and loggers could gain additional stream of revenue from biomass and create healthier forests in the process, but more markets with a haul distance of 40 miles or less are needed.
Economic Availability of Biomass Resources

Forest Stewardship Videoconference June 17th, 2008
Matthew Langholtz
www.bio-resource.com

Research by Wood to Energy Project, SFRC UF

The Wood to Energy Outreach Program

• Increase awareness and knowledge
• Foster communication, collaboration, cooperation
• Provide outreach strategies
• Wildland-urban Interface communities

Program Products

• General Technical Report
• Biomass Ambassador Guide
• 16 Fact Sheets
• 14 Case Studies
• 13 Economic Profiles
• Presentations
• CD, Web site: www.interfacesouth.org/woodybiomass

All outreach materials were designed based on public perceptions research and pilot tests.
Overview

- Counties selected
- Wood availability and cost
- Economic impacts of using woody biomass for bioenergy production

Selected counties for community profiles

Woodsheds
Potential quantities of woody biomass

**SOURCE:**
- Urban waste wood
- Land-clearing debris
- Restoration & forest health
- Forestry residues
  - Thinning for wildfire risk reduction & mgmt
  - Branches from harvesting
- Wood grown specifically for energy production

**DATA USED:**
- Nat’l average = .203 green tons/person/year @ 56,000 people
- FIA Timber Products Output Report/county for residue
- FIA Timber Products Output Report/county for pulpwood

## Supply

<table>
<thead>
<tr>
<th>County</th>
<th>Available urban wood waste</th>
<th>Available logging residues</th>
<th>Harvested pulpwood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alachua</td>
<td>26,000</td>
<td>85,900</td>
<td>292,500</td>
</tr>
<tr>
<td>Clay</td>
<td>19,800</td>
<td>50,000</td>
<td>239,000</td>
</tr>
<tr>
<td>Leon</td>
<td>28,500</td>
<td>32,600</td>
<td>156,800</td>
</tr>
<tr>
<td>Nassau</td>
<td>7,500</td>
<td>94,500</td>
<td>300,400</td>
</tr>
<tr>
<td>Santa Rosa</td>
<td>16,600</td>
<td>55,400</td>
<td>235,900</td>
</tr>
</tbody>
</table>
Wood availability and Cost: two axes for two questions

1. How much supply?
2. At what price?

Costs:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Estimated purchase cost ($/dry ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Wood Waste</td>
<td>-$25</td>
</tr>
<tr>
<td>Forestry Residues</td>
<td>$0</td>
</tr>
<tr>
<td>Pulpwood</td>
<td>$16</td>
</tr>
</tbody>
</table>

- Harvest and process: $20-$30 per dry ton.
- Transportation: $5-$12 per dry ton.
Florida Results

Available energy and delivered cost for each wood resource/haul time category within one hour of the center of each county. Resources are ranked from cheapest to most expensive based delivered cost of energy.

<table>
<thead>
<tr>
<th>Delivered cost ($/MMBtu)</th>
<th>Resource/haul time category</th>
<th>Trillion Btu available per year within a one-hour haul radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.65</td>
<td>Urban wood: 0-15 minutes</td>
<td>0.02 0.02 0.06 0.01 0.01</td>
</tr>
<tr>
<td>$0.85</td>
<td>Urban wood: 15-30 minutes</td>
<td>0.11 0.10 0.15 0.04 0.04</td>
</tr>
<tr>
<td>$1.05</td>
<td>Urban wood: 30-45 minutes</td>
<td>0.16 0.29 0.12 0.31 0.11</td>
</tr>
<tr>
<td>$1.25</td>
<td>Urban wood: 45-60 minutes</td>
<td>0.17 0.62 0.09 0.49 0.19</td>
</tr>
<tr>
<td>$2.03</td>
<td>Logging residues: 0-15 minutes</td>
<td>0.09 0.05 0.08 0.12 0.02</td>
</tr>
<tr>
<td>$2.21</td>
<td>Logging residues: 15-30 minutes</td>
<td>0.50 0.29 0.40 0.43 0.13</td>
</tr>
<tr>
<td>$2.39</td>
<td>Logging residues: 30-45 minutes</td>
<td>0.97 0.69 0.88 0.73 0.34</td>
</tr>
<tr>
<td>$2.56</td>
<td>Pulpwood: 0-15 minutes</td>
<td>0.24 0.23 0.32 0.30 0.06</td>
</tr>
<tr>
<td>$2.57</td>
<td>Pulpwood: 15-30 minutes</td>
<td>1.29 1.36 1.41 1.06 0.56</td>
</tr>
<tr>
<td>$2.72</td>
<td>Pulpwood: 30-45 minutes</td>
<td>1.50 1.09 1.27 1.12 0.47</td>
</tr>
<tr>
<td>$2.88</td>
<td>Pulpwood: 45-60 minutes</td>
<td>3.61 2.15 2.36 1.95 1.17</td>
</tr>
<tr>
<td>$3.04</td>
<td>Pulpwood: 60-90 minutes</td>
<td>4.14 4.00 3.83 3.06 1.85</td>
</tr>
</tbody>
</table>

1Delivery to the Duvalham facility.
2Delivery to the county center.

Anatomy of a Supply Curve

- **$35/ton Forest thinnings**: $35/ton
- **Urban wood waste**: $15/ton
- **Supply (tons/yr)**: 150,000 tpy
- **Logging residues**: $30/ton in 100,000 tpy

<table>
<thead>
<tr>
<th>Price ($/green ton)</th>
<th>Supply (tons/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$35</td>
<td>150,000 tpy</td>
</tr>
<tr>
<td>$30</td>
<td>150,000 tpy</td>
</tr>
<tr>
<td>$15</td>
<td>100,000 tpy</td>
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</table>
Supply Curves
Potential Economic Impacts of a Wood-to-Energy Facility

Economic Structure of the Wood Energy Industry
Employment Impacts of Operations for 20 and 40 MW Wood Power Plant in Selected Counties

Direct, Indirect, and Induced Output (Revenue) Impacts of Operations (1st yr) for 20 MW Wood Power Plant in Selected Counties
### Employment Impacts by Occupational Group for Operations of a 40MW Wood-Fired Power Plant in Alachua County, FL

<table>
<thead>
<tr>
<th>Occupational Group</th>
<th>Jobs</th>
</tr>
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<tbody>
<tr>
<td>Farming, Fishing, and Forestry</td>
<td>98.7</td>
</tr>
<tr>
<td>Other Non-specified</td>
<td>48.8</td>
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<tr>
<td>Office and Administrative Support</td>
<td>34.2</td>
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<tr>
<td>Transportation and Material Moving</td>
<td>28.4</td>
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<tr>
<td>Sales and Related</td>
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<tr>
<td>Food Preparation and Serving Related</td>
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<tr>
<td>Architecture and Engineering</td>
<td>10.9</td>
</tr>
<tr>
<td>Installation, Maintenance, and Repair</td>
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</tr>
<tr>
<td>Management</td>
<td>9.5</td>
</tr>
<tr>
<td>Production</td>
<td>9.2</td>
</tr>
<tr>
<td>Healthcare Practitioners and Technical</td>
<td>7.4</td>
</tr>
<tr>
<td>Building and Grounds Cleaning and Maintenance</td>
<td>6.5</td>
</tr>
<tr>
<td>Business and Financial Operations</td>
<td>6.3</td>
</tr>
<tr>
<td>Construction and Extraction</td>
<td>5.8</td>
</tr>
<tr>
<td>Personal Care and Service</td>
<td>5.4</td>
</tr>
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<td>Healthcare Support</td>
<td>4.0</td>
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<tr>
<td>Computer and Mathematical</td>
<td>3.3</td>
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<tr>
<td>Education, Training, and Library</td>
<td>2.6</td>
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<tr>
<td>Life, Physical, and Social Science</td>
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<tr>
<td>Arts, Design, Entertainment, Sports, and Media</td>
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</tr>
<tr>
<td>Total</td>
<td>333.6</td>
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</table>

### Summary

- There is a significant supply of cost-competitive wood in the selected Florida counties to warrant further investigation.
- Of course, there may be additional FL counties that are suitable for consideration.
- A wood-to-energy facility provides significant economic output and could create a variety of jobs.
**Sources and Supply**

Energy sources that can be regenerated without depleting the underlying stock are considered “renewable.” Examples of renewable energy sources include biomass, such as wood or other agricultural crops; water; wind; and sunlight. However, in order for the conversion of wood to energy to be economically viable and environmentally responsible, forests must be properly managed to ensure that bioenergy projects do not use more wood than is sustainably available. A key component to sustainable forestry is ensuring that forests are not depleted by overharvesting. This means that wood removal cannot exceed wood growth in the long term.

The sustainable amount of wood that is available depends on the productivity of local forests and land-use practices. Proper management of the forest resource can be split into two categories. First, forest managers must make accurate measurements of how much wood can be removed without harming forests. Second, care must be taken to use fuel wood as efficiently as possible. In many cases, this means using wood that is actually a residue from other activities, such as timber harvesting and land clearing for development. In this fact sheet, we discuss each of these factors in the context of the southern United States.

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**Available Data on U.S. Forests**

The Forest Inventory and Analysis (FIA) program of the USDA Forest Service was mandated by the McSweeny-McNary Forest Research Act of 1928 and the Forest and Rangeland Renewable Resources Planning Act of 1974 to monitor the quantity and quality of timber on the nation’s forestlands. FIA collects data on sample plots annually within each U.S. state. FIA data, including forestland area, timber growth, and harvest volumes, can be accessed at [http://www.ncrs2.fs.fed.us/4801/timber.products/index.htm](http://www.ncrs2.fs.fed.us/4801/timber.products/index.htm).

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**Forest Sustainability in the Southern United States**

The U.S. produces more than 25 percent of the world’s total industrial timber and is the second largest exporter of timber products after Canada. Most of this timber is produced in the South (Wear and Greis 2002). In spite of these high rates of production, average wood growth in the southern U.S. continues to surpass the amount of wood harvested. Future timber growth is projected to be greater than harvests in response to projected demands for timber (Adams et al. 2003). This means that researchers are predicting that forests will be growing faster than people are using wood. At local levels, sustainable forest management can provide woody biomass for energy along with other wood products.

Nationally, the volume of timber has increased over the past fifty years from 616 to 856 billion cubic feet, mostly from conversion of agricultural lands to forestlands (Smith et al. 2004). The most recent available Forest Inventory and Analysis (FIA) data indicates net growth\(^1\) of growing stock\(^2\) was greater than harvest for ten of the thirteen southern states (Figure 1). In other words, in ten southern states, wood is being grown faster than it is harvested.

**Sources of Woody Biomass**

Waste wood and industry by-products are good candidates for woody biomass sources because they are inexpensive and do not represent added pressure on local forests. Unfortunately, FIA data only include forestry residues and not urban waste or by-products. County-level yields of logging residues across the South vary widely, from zero to 222,000 dry tons per year, reflecting

---

1 “Net growth” means growth before harvests minus mortality.
2 “A growing-stock tree is a live tree of commercial species that either contains or is capable of producing at least one 12-foot or two 8-foot logs in the saw-log portion” (Bentley and Johnson 2004).
variation in county size and forestry practices. For some communities, however, this can be a significant source of fuel. In Alachua County, Florida, for example (a mid-sized county with a modest forestry industry), 60,106 dry tons of forestry residue is sustainably available per year. This is equivalent to about 7 megawatts (MW) of electricity generation. Following is additional information about potential sources of woody biomass.

**Forestry By-products.** Local forests in which trees are grown for sawtimber produce waste wood in two ways. The first is from forest thinning. Trees for sawtimber are often planted at high densities so that they produce straight, knotless wood. However, as the trees grow, they require more room in order to thrive and are thinned accordingly. For example, the trees may originally be planted at a density of 700 trees per acre. After twelve years, these trees may be thinned to a density of 400 trees per acre. Forests may be thinned two to three times during the course of the trees’ development. At the first and second thinning, the cut trees may be too small to be sold as lumber but can be made available for power production.

The second source of waste wood from sawtimber operations comes during the harvesting of the timber. Stumps, branches, and tree tops that are too small for lumber production are often left on the harvest site or otherwise disposed of. These residues too can be used for producing energy. However, stumps are often difficult to remove and may bring along dirt and rock. In addition, leaving stumps in the ground helps reduce soil erosion. Any changes in local timber producing activities can cause changes in the amount of residue wood available for power production. For example a shift from pulp wood production for paper—which can use smaller trees—to sawtimber production would make larger quantities of wood from thinnings available for energy production during the forest’s lifetime.

Typically, the wood from harvesting operations is simply piled up on-site and burned or left to rot. Often when people think of using wood for energy, they worry about the carbon within the wood adding to greenhouse gases. It is important to note that whether this wood is burned on-site, left to decay, or burned for energy, the carbon contained in the wood is released into the atmosphere. See the fact sheet, *Climate Change and Carbon,* for more information about this topic. All of our materials can be found at http://www.interfacesouth.org/woodybiomass.

The potential benefit of burning wood in a controlled environment such as a utility plant is that pollution control devices help reduce air pollution.

Let’s use Gainesville, Florida, as an example to get an idea for how much energy could be supplied by using the two types of waste wood we’ve described. Slash pine operations have been shown to produce about 15 green tons
Sources and Supply

(or wet tons) of wood waste per acre from harvesting operations (Watson et al. 1986).

There are approximately 1.38 million acres of pine plantations within 50 miles of Gainesville’s largest power plant. Each dry ton of wood represents about 16 million British thermal units (Btu) of energy. If we assume half of the logging residues are available for energy, then on each acre harvested about 7 green tons of wood are available, which equals about 3 dry tons of wood. Therefore, 3 dry tons of wood per acre x 1.38 million acres equals about 4.1 million dry tons. Multiplying the 4.1 million dry tons by their energy content—16 million Btu/ton—yields $6.6 \times 10^{13}$ Btu. Logging operations in the South often have 25-year cutting cycles, meaning that each acre will be cut once every 25 years. So, we can divide the $6.6 \times 10^{13}$ Btu by 25 to get about $2.6 \times 10^{12}$ Btu available annually. Assuming that $1.0 \times 10^{11}$ Btu per year equals 1 MW per year, $2.6 \times 10^{12}$ Btu divided by $1.0 \times 10^{11}$ Btu/MW/year yields 26 MW of energy per year from the wood waste of timber operations.

Habitat Restoration and Fuelwood Control. Another source of wood available for energy production is from the management of natural areas. For example, managing a natural area to maintain a specific kind of habitat (e.g., longleaf pine) requires removing certain species of trees that are not naturally found in that habitat. These removed trees can become a source of fuel for a biomass power plant.

Secondly, many forests require fire management. In pristine forests, naturally occurring fires keep the amount of woody biomass—such as dead wood and underbrush—under control. Forest managers can mimic this natural process with controlled burns or by removing some of the woody biomass from the forest using machines. In the latter case, the woody biomass removed from the forest can be available for energy production. Thinning may be particularly preferable for forests in the wildland-urban interface (where human development meets undeveloped natural areas) because the risk of fire must be reduced to protect nearby homes, and prescribed burning can create conflicts.

Urban Wood Waste. Wood removed from residential and business properties, such as unwanted trees and trimmed limbs, can also be a significant source of wood for energy production. Research has shown that there are about 0.12 dry tons of urban wood waste (city tree trimmings and storm debris) generated per person per year (Wiltsee 1998). For an average county population size in the southern U.S. of about 75,000, this is equivalent to 9,000 dry tons of wood, which can provide enough power to supply 400 to 900 homes per year (Bellemar 2003). Many people living in the southern U.S. can attest to the increase in yard waste that results from storms falling trees and limbs. Since people currently pay to have their yard waste removed—either to private landscapers or within their utilities bill—collecting this waste as a source of fuel can become an economically viable operation for an energy facility.

Phyto remediation. The term phyto remediation describes the process of using trees to clean up sites that have contaminated soil or water. Trees planted in these areas extract the contaminants, such as arsenic and nitrates, from the soil as the trees grow. The trees, along with the contaminants they contain, can then be removed from the site and used for energy production. The contaminants may become denatured by the high temperatures of combustion or captured in ash or air emission control systems. Notably, wood from phytoremediation projects contains lower amounts of contaminants than what is normally found in coal.

Commercially Available Wood. The previous four sections of this fact sheet all involve the use of waste wood from other processes. Another potential source of wood for energy production is small-diameter wood from timber plantations. Since forest landowners have the option of selling their wood to the highest bidder, when the price of wood is low at pulp mills, or when the price for energy is high, an estimated 8 million dry tons of wood currently grown for conventional timber products could be allocated to energy production (Perlack et al. 2005). This is enough energy for about 1,200 MW of electricity or 500,000 to 1,000,000 homes annually.

Additional Aspects of Sustainable Forestry

In addition to sustained yield, other aspects of sustainable forestry include biodiversity, ecosystem health, social values, and soil quality. Various governmental and
nongovernmental agencies are dedicated to fostering sustainable forest management. Having a biomass source “forest certified” by an independent forest auditor is one option for communities that want to ensure sustainability of the fuel products. See the fact sheets Sustainable Forest Management and Environmental Impacts for more information on these topics.

**Find Out More**

You can find more general information about bioenergy at the Renewable Energy Policy Project Web site (http://www.repp.org/bioenergy/index.html). More information about forest thinning for sawtimber production is available in a paper by David South of Auburn University (http://www.forestry.auburn.edu/sfnmc/class/density.htm). And more information on sustainable forest management and forest certification can be found at the USDA Forest Service (http://www.na.fs.fed.us/sustainability), the Forest Stewardship Council (www.fsc.org), and Abundant Forests (www.abundantforests.org).

For more information about using wood to produce energy, visit http://www.interfacesouth.org/woodybiomass and read other fact sheets, community economic profiles, and case studies from this program, or http://www. forestbioenergy.net/ to access a number of other resources.

**References**


**Authors**

Matthew Langholtz, Post-Doctoral Research Assistant, Richard Plate, Outreach Research Associate, and Martha C. Monroe, Associate Professor, School of Forest Resources and Conservation, University of Florida, Gainesville, FL.
Climate Change and Carbon
Annie Oxarart & Martha C. Monroe

Most scientists agree that our climate is changing as a result of human activities, particularly burning fossil fuels for power and transportation. Climate change includes alterations to weather patterns, such as extended changes in temperature, precipitation, or wind and is due to several factors, one of which is human-produced greenhouse gases (U.S. EPA 2007). Fossil fuels—coal, natural gas, and oil—are ancient deposits of carbon that have been buried beneath the earth’s surface for millions of years. The combustion of fossil fuels releases greenhouse gases, such as carbon dioxide, which trap heat in our atmosphere and contribute to global climate change (UNEP 1997). Currently, using fossil fuels to generate energy is commonplace, but if we choose to use energy sources that release fewer greenhouse gases into the atmosphere, we can begin to positively affect our future. Wood is one energy source that is renewable and does not significantly contribute to an increase in atmospheric carbon dioxide.

Greenhouse Gases and Climate Change

Greenhouse gases, such as carbon dioxide, nitrous oxide, methane, and water vapor are naturally present in the atmosphere and allow visible light from the sun to warm the earth. These gases trap some heat inside our atmosphere to maintain temperatures that support life on Earth. The temperature of Earth is maintained by incoming solar radiation and heat loss to space. When additional greenhouse gases are added to the atmosphere, less heat is released, and Earth’s surface is warmed. This process is commonly known as global warming and results in a gradual increase in average global temperature (U.S. EPA 2007). To better understand how this works, think about your car with its windows two-thirds open sitting in a parking lot on a sunny day. Some heat will escape through the open windows, while some heat will remain trapped inside. The car is warm when you come back, but not stiflingly hot. On the other hand, if the windows are cracked only one-third open, most of the heat cannot escape and becomes trapped inside the car. When you open up the door, the inside of the car is hotter than the outside temperature. The first scenario is similar to what happens with normal levels of greenhouse gases in the atmosphere; the second is what happens when there is a build-up of greenhouse gases in the atmosphere. Of all the greenhouse gases, levels of carbon dioxide have increased the most in recent years, and scientists credit this rise as the largest contributing factor in global climate change (UNEP 1997). Reducing carbon dioxide emissions is an important part of slowing global climate change.

The Carbon Cycle

Carbon cycles continuously through all plants and animals, soils, oceans, and the atmosphere (Figure 1). This cycle results in a natural balance of carbon dioxide levels. Carbon is a major part of the makeup and function of all living organisms. Humans get carbon from food. Green
plants absorb carbon from the atmosphere during photosynthesis. In addition, living plants and animals store carbon as they grow and release carbon as they decompose (U.S. EPA 2007). The growing of trees and decomposition of wood represents a short-term carbon cycle, where growing trees convert carbon dioxide to wood and decomposing trees release carbon dioxide back into the atmosphere. Whether trees naturally decompose or are burned, carbon dioxide is emitted back into the atmosphere, replacing the carbon that was recently absorbed.

Conversely, fossil fuels are ancient carbon deposits that have not been part of the short-term carbon cycle for millions of years. When fossil fuels are burned, carbon dioxide is added to the atmosphere, not all of which can be absorbed by living organisms into the carbon cycle (Matthews and Robertson 2005). Uptake of carbon dioxide by land plants and oceans is not fast enough to prevent an increase in the overall amount in the atmosphere. Planting more trees to compensate for burning more fossil fuels, although helpful, is not a sustainable solution to global climate change. We do not have enough land area to continually plant enough trees to absorb and store the additional carbon emitted from burning fossil fuels.

**Using Wood is Carbon Neutral**

Unlike fossil fuels, wood represents a carbon-neutral source of energy. This means that using energy from biomass will not increase the overall amount of carbon dioxide in the atmosphere, if the production of the trees is managed on a sustainable basis (Matthews and Robertson 2005). This fact may sound surprising since combusting wood releases carbon dioxide into the atmosphere; however, the process of growing trees removes carbon dioxide from the atmosphere. Therefore, the carbon emitted from burning wood is re-absorbed as new trees grow. As long as we grow as many or more trees than we burn, woody biomass use contributes less to global climate change than using fossil fuels for energy generation (Box 1 and Figure 2).

Currently, at some level all renewable energy sources such as solar, wind, water, and wood require the input of fossil fuels. Planting, harvesting, transporting, and processing woody biomass currently uses fossil fuels. However, we could lessen the overall contribution of carbon dioxide into the atmosphere if the energy needed for these processes were to come from renewable sources. For example, biodiesel, a renewable fuel with low emissions, can be used in place of diesel fuel in many diesel engines.

**Wood Is Renewable if Forests Are Replanted**

Wood is a renewable resource that can be used as a fuel to produce energy. In managed forests, harvested trees are replanted through sustainable practices that
promote long-term forest health and productivity. If land is cleared for development and other uses, trees are not replanted in the same density as the original forest. This type of land conversion, called deforestation, contributes to global climate change because fewer trees are available to absorb and store, or sequester, carbon dioxide. Young, growing trees sequester additional carbon from the atmosphere. Old forests have some dead and dying trees that release carbon, and while large old trees represent carbon storage, they are not as effective as young trees at taking up carbon (Matthews and Robertson 2005). Thus, the cycle of growing, harvesting, and replanting trees can provide renewable sources of energy and sequester carbon dioxide from the atmosphere.

Landowners that practice sustainable forestry can receive a steady income through timber sales. Using trees for energy production provides landowners with an alternative market, and this economic incentive is another way to keep land forested rather than converted into development. Since growing trees sequester carbon dioxide, keeping land forested is another strategy for slowing global climate change. In fact, carbon credit systems are becoming more common and may help pay landowners to grow trees. In these systems, money is paid to forest owners for the amount of carbon their forest can absorb and store by those who are emitting carbon dioxide.

Summary

As the population continues to grow, we will need to find new solutions for our increasing energy needs. One important piece of this solution will be to reduce the overall amount of energy each person needs through conservation and increased efficiency. Options other than fossil fuels should be sought because increased amounts of carbon dioxide in the atmosphere from fossil fuels will escalate climate change. Communities should consider a variety of energy sources and decide how they can best plan for a sustainable future. Using wood to generate energy may be part of this discussion in some communities.

References


For More Information

To learn more about climate change visit http://www.epa.gov/climatechange and http://www.climatechange.unep.net. For more information about woody biomass and climate change, see the IEA Bioenergy’s “Answers to ten frequently asked questions about bioenergy, carbon sinks, and their role in global climate change” at http://www.ieabioenergy-task38.org/publications/faq/.

For more information about using wood to produce energy, visit http://www.interfacesouth.org/woodybiomass and read other fact sheets, community economic profiles, and case studies from this program, or http://www.forestbioenergy.net to access a number of other resources.

Authors

Annie Oxarart, Outreach Research Associate and Martha C. Monroe, Associate Professor, School of Forest Resources and Conservation, University of Florida, Gainesville, FL.
Study: Green energy parks could emerge here
Florida's Great Northwest says area could be a leader in the industry
By Thomas J. Monigan

Tuesday May 6th, 2008, Northwest Florida Daily News

Either Okaloosa, Walton or Santa Rosa County could see a 1,000-acre development known as a Green Energy Business Park taking shape by the start of the next decade if a study released Tuesday by Florida's Great Northwest proves accurate.

“We believe Northwest Florida has an opportunity to become a leader in the renewable energy and fuels industry,” Fred Leopold, board chairman of Florida's Great Northwest, stated in a press release.

Boston-based SJH and Co. presented the results from a study that began last August delivered at a meeting of Florida's Great Northwest renewable energy council.

SJH’s long-term recommendation is to pursue the development of the biofuels industry as conversion technology is developed and distribution systems become more refined and economical. The report concludes that the 16-county Northwest Florida region could most likely support three to four Green Energy Business Parks.

“We don't know the specific size, but the model would be 1,000 acres,” said Sonya Negley, business and community development manager for Florida’s Great Northwest.

The Green Park concept would use a mixed recipe of native-grown, renewable feedstocks such as timber biomass, along with municipal solid waste in combination with food waste to maximize BTU values.

Developed and run by private industry, such a park would act as a central feed-stock collection and staging area. It would house various alternative energy companies and other related businesses. It also would serve as a platform for the development of future advanced technologies as well as a magnet to attract new businesses in the renewable energy and fuels industry.

And where would those Green Parks be located?

“It all depends on infrastructure, location and available acreage, whether or not it’s an existing park, and proximity to existing power companies,” Negley said. “We’re looking at probably three years before we could start building the first park.”

Almost $50,000 of this $900,000 study was funded by a U.S. Department of Agriculture Rural Development Grant. A second study, which would determine how much timber was available on private land, has yet to be commissioned.

Daily News Business Editor Thomas J. Monigan can be reached at 863-1111, Ext. 1438.
Company looks to build Florida’s first biomass gas plant in Tallahassee

By Bruce Ritchie
news-press.com Tallahassee bureau

TALLAHASSEE — A Georgia company wants to build Florida’s first biomass gas plant at a Florida State University industrial park in Tallahassee.

Gov. Charlie Crist last year proposed requiring that 20 percent of Florida’s future energy needs come from renewable sources, which he says includes such biomass plants.

Biomass Gas & Electric LLC proposes to heat wood chips to convert them into gas, which will be burned to produce electricity. The wood chips will arrive in about 100 railroad cars every seven to 10 days.

The company already is behind on getting its state permits. The city of Tallahassee, which will buy the 42-megawatts produced by the plant, has agreed to extend the company’s deadline for getting the permits by six months —with the understanding that the plant still will begin operating in 2010.

The Florida Department of Environmental Protection on Friday asked BG&E, located in Norcross, Ga., for additional information on the permit, which was submitted on April 3.

Biomass energy plant proposed for Florida

Ga. firm uses wood chips to produce electricity

news-press.com Tallahassee bureau

A Georgia company wants to build Florida’s first biomass energy plant - turning wood chips into electricity - at a Florida State University industrial park.

Before that can happen, the company, Biomass Gas & Electric LLC, needs to answer questions from the Florida Department of Environmental Protection.

The company already is behind on getting its state permit. The city of Tallahassee, which will buy the 42 megawatts produced by the plant, has agreed to extend the company’s deadline for getting the permits by six months, until December - with the understanding that the plant still will begin operating in 2010.

"I feel good about it," said Glenn Farris, president and CEO of Biomass Gas & Electric. "The questions they (DEP officials) asked were reasonable, normal types of questions."

Based in Norcross, Ga., BG&E proposes to heat wood chips to convert them into gas, which will be burned to produce electricity. The plant, located on 22 acres in FSU’s Innovation Park, will be called the Tallahassee Renewable Energy Center.
Gov. Charlie Crist last year proposed requiring 20 percent of Florida's future energy needs to come from renewable sources, which he says includes such biomass plants. On Tuesday, Florida's Great Northwest, an economic development group in Florida's Panhandle, said the region should focus on building three or four green energy parks to produce energy from wood.

In Tallahassee, BG&E will receive wood chips in about 100 rail cars that will arrive every week to 10 days, the company said in its permit application.

The company last year withdrew from Liberty County after facing opposition to a second biomass plant under a contract with Progress Energy. Residents said they were concerned about truck traffic and pollution from burning garbage although the company said it would burn only wood waste.

In the application for the Tallahassee plant, the company says it plans to burn a small percentage - less than 30 tons per day - of municipal solid waste, such as yard trimmings. The company says a federal air pollution rule that applies to municipal solid waste incinerators does not apply.

A state rule on incinerators doesn't apply because the plant won't actually burn anything, the company said. Rather it heats wood without using oxygen. Similarly, the plant doesn't qualify as a waste-to-energy plant because the term doesn't apply to facilities that burn forestry waste or wood.
Carbon Credits
Details of Eligible CCX Offsets

Forestry Offsets (XFOs)
New Tree Plantings
Sustainably Managed Forest

Two XFO protocols
• **Afforestation** – New trees planted after January 1, 1990.
• **Sustainably Managed Forests** – Forest land under a certified, sustainable forest management plan.

New AgraGate Forestry Contract

Contract overview – one contract
• We are combining afforestation and sustainably managed provisions into one contract.
• The XFO contract will be a 15-year contract (i.e., 2008-2022) with an option to earn credits back to 2003. There is an “out clause” in the event that the CCX is not registering credits through the year 2022.
• Participants can initially enroll under the afforestation provisions and later transition to the sustainably managed forest provisions of the contract. They will need to be compliant with the managed forest provisions and complete a new worksheet.
New AgraGate Forestry Contract

Contract overview – carbon sequestration determination

- For Afforestation projects, credits earned can be calculated using either the CCX Carbon Accumulation tables or through direct measurement using a growth and yield model.
- For Sustainably Managed Forest projects, we need to use direct measurement and a growth and yield model.

New AgraGate Forestry Contract

Contract overview – reserve credits

- At registration, 20 percent of credits will be placed into a Reserve account.
- Reserve credits will not stay in the reserve account for more than five (5) years. After five years in the reserve account, credits will be released and available for sale.

New AgraGate Forestry Contract

Contract overview – payment approach

- Contract holders will be paid based upon their projected net credit contribution to the respective forestry pool over the life of the contract.
- Projected net credit contribution over the life of the contract will be determined by:
  - Growth and yield model annual carbon sequestration projections.
  - Land owner estimate of thinning/harvesting during life of contract.
  - Projected disposition of harvest timber
- End of contract (and possibly intermediate) “true ups” will be needed.
New AgraGate Forestry Contract

General Guidelines for enrolling applicants

- Potential participants will need to indicate their projected thinning/harvesting events during the course of the contract as well as timber disposition expected.
- A managed forest contract may not work for those who plan to clearcut during the contract period
- Payments to participants will follow carbon sequestration patterns of the pool and not of the individual participants project.

XFO Eligibility - Afforestation

- Planting and/or natural regeneration on private lands after Jan 1, 1990 on land not forested on Dec 31, 1989
- A contractual commitment to maintain the enrolled land as forest for at least 15 years from the enrollment date and sign a letter of intent to do so.
- Credits based on annual increase in carbon stocks as determined via CCX Accumulation tables or through direct measurement.
- Thinning will not be allowed.

Quantification and Verification

Establishing carbon accumulation rates
- Use CCX Carbon Accumulation tables or
- Use direct measurement with a growth/yield model

Verification
- All projects will have annual desktop audits
- 10% of all pooled projects must have on-site verification
- Offset verification costs are the responsibility of the offset project owners
- Verification projects will be managed by the aggregator
CCX XFO Afforestation Credits

Rates

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XFO Terms and Conditions

- XFOs through this contract shall be in compliance with the rules of the CCX at the time of credit registration and will abide by the rules for participation in the forestry carbon pool as set forth by this contract.
- In the event that the project fails to meet these requirements, XFOs from such land shall be null and void.
XFO Terms and Conditions

- Noncompliance due to uncontrollable events:
  In the case of noncompliance that results from adverse weather, natural disaster, or pestilence that is not controllable by the project owner, the liability of the project owner shall be limited to forfeiture of any existing reserve credits.

- Transfer price of the XFOs is the sales price as determined by sale through the Chicago Climate Exchange less a 10% service fee retained by AgraGate.

- Contracts facilitated by a Forest Service Provider will be subject to an additional 10% service fee which will be paid to the Forest Service Provider.

- Verification costs are the responsibility of the applicant.

- Exchange offset registration fees will be deducted from pool proceeds prior to payment calculations.

- Payment for XFOs covered by this contract shall be made on a semi-annual basis after pricing of the XFOs through the Chicago Climate Exchange.

- Sale of XFOs covered by this contract shall be at the sole discretion of the Purchaser, however all XFOs shall be priced no later than June 30, 2023.
XFO Eligibility – Managed Forests

- Provide evidence of sustainable forest management through certification from agencies or schemes indorsed by PEFC (e.g., SFI, ATFS), the Forest Stewardship Council (FSC), or other certification programs approved by the CCX Committee on Forestry.
- Make a 15-year contractual commitment to a sustainable forest management program and a signed letter of intent.
- Provide verified documentation for the net changes in carbon stocks on eligible sites.

XFO (forestry) credits are earned on average annual net carbon accumulation

\[ \text{CO}_2 \text{ sequestered} = \text{harvest} + \text{long-lived wood product credit} \]

XFO – Managed Forests

- Net Change in Carbon Stocks must involve a model-based accounting approach.
- A baseline of carbon stocks (i.e., starting inventory) must be established in order to calculate annual net changes in carbon stocks.
- All Managed Forest projects are subject to approval by the CCX Committee on Forestry.
New AgraGate Forestry Contract
Carbon Credit Financial Simulation model example

- 15-year contract
- Seven year-old stand at start of contract
- 54 green tons baseline volume in stand
- 2.5 to 4.2 MT/acre growth over the 15 years
- 50 percent thinning at age 15 (year 8 of contract)
- 50% softwood sawlogs, 30% softwood pulpwood, 1% hardwood sawlogs, and 5% hardwood pulpwood

New AgraGate Forestry Contract
The challenge of payments to contract owners

Sample Managed Forest Project
CO2 Sequestered over life of contract

[Chart showing CO2 sequestered over time with 1.4 tons/acre/yr average sequestration]
New AgraGate Forestry Contract
Total payment based on net CO2 Sequestration

Participants are paid on the net proceeds from the sale of your carbon credits

Sustainably Managed Forest example

Gross revenue-
- 1.4 credits/acre/year * $6/credit = $8.40/acre/year

Costs-
- **Aggregator fee:** 10%*$8.40=$0.84/acre/year
- **CCX costs:** $0.20/credit*1.4 credits/acre/year = $0.28/acre/year
- **Verifying costs (estimate):** $0.20/credit*1.4 credits/acre/year = $0.28/acre/year
- **Forest Service Provider costs:** 10%*($8.40-$0.84-$0.28-$0.28) = $0.70/acre/year

Net Proceeds-
- $8.40-$0.84-$0.28-$0.28-$0.70 = $6.30/acre/year
Documents Needed for XFO Enrollment

- Forestry Offset Contract (XFO contract)
- Forestry Offset Enrollment Worksheet(s)
- FSA, Forest Service or NRCS maps of enrolled areas
- Copies of supporting documents (i.e., Planting records, CRP contracts, forestry management plan, etc.)
- Evidence of ownership document (e.g., copy of deed)
- Supporting documents for direct measurement calculations (if applicable)
- Signed Letter of Intent to maintain forest carbon stock beyond 2010
- A voided check from your checking account so that we can set up electronic transfer of funds

Florida Forest Service Providers

- **David Black**
  Dominion Energy Inc.
  Destin, FL
  850.978.1524
  blacks@earthlink.net

- **Henry Maclin**
  Walton Plantation
  Santa Rosa Beach, FL
  850.622.9156
  hmaclin3@aol.com

- **Jeff Main**
  Land & Timber Services Group
  Tallahassee, FL
  850.668.8333
  jmair@comcast.net

Contact Information

The Florida Farm Bureau Federation
352-384-2661
carbontrading@ffbf.org

AgraGate Climate Credits Corporation
www.agragate.com
866-633-6758
info@agragate.com
Frequently Asked Questions
Exchange Forestry Offsets (XFO)

Who is running the carbon credit pilot program?
The carbon credit pilot program is being offered and managed by the Chicago Climate Exchange (CCX), a commodity exchange for greenhouse gases. The CCX is the world’s first and North America’s only voluntary, legally binding rules-based greenhouse gas emission reduction and trading system. The aggregator or organization that serves as the middleman between the CCX and participating landowners, is AgraGate Climate Credits Corp, a wholly-owned subsidiary of the Iowa Farm Bureau.

What is a "carbon credit"?
A "carbon credit," or Exchange Forestry Offset (XFO), is a market term. Registered companies with the CCX exchange agree to voluntarily reduce CO₂ emissions by 4 percent by 2006 and by 6 percent or more by 2010. Some examples include Dupont, Dow, and Ford Motor Company. Some reductions come from company change and other reductions can be from buying a carbon credit from a land owner who is managing his/her forest in a way that increases carbon sequestration on a long-term basis. A carbon credit is normally quantified in terms of "carbon dioxide equivalent (CO₂e).” One carbon credit is equal to one metric ton of CO₂e. A company cannot achieve more than 50 percent of their reductions from purchased offsets.

How can land owners with forest land participate in the carbon credit market?
Land owners can participate under an Afforestation program and/or under a Sustainably Managed Forest program. Land owners are eligible for the Afforestation program if they planted trees after January 1, 1990 on land that did not previously have trees. Under Afforestation, the land owner can not thin or harvest trees on enrolled land. Land owners are eligible for the Sustainably Managed Forest program if they follow a certified forest management program. Approved certification systems include Forest Stewardship Council (FSC), American Tree Farm Systems (ATFS), the Sustainable Forest Initiative (SFI), and any other CCX-approved certification system.

How do I start the process of enrollment?
Land owners wanting to enroll in the CCX XFO market will need to work with an aggregator that is a member of the CCX. AgraGate Climate Credits Corporation is an aggregator member of CCX. The land owner and AgraGate will enter into an XFO contract that specifies all eligibility requirements and terms and conditions for participation.

Contact AgraGate or one of our associate aggregators to start the enrollment process.

What is the length of time of the XFO contract?
The XFO contract with AgraGate has a term length of 15 years.

How many credits can I earn under the Afforestation program?
The number of carbon credits earned under an Afforestation contract will depend on the quantification method used. Carbon credits can be quantified by either using the CCX Carbon Accumulation tables or by using a direct measure approach with a growth and yield model. In the CCX carbon accumulation tables, carbon credit rates are a function of geographic region of the U.S., species category, and age of trees. With the direct measurement approach, carbon accumulation is projected over time using a CCX-approved growth and yield model.
How many credits can I earn under the Sustainably Managed Forest program?
Under the Sustainably Managed Forest program, carbon credit accumulation can only be estimated using the direct measurement approach and a growth and yield model. The aim is to estimate net carbon accumulation over time and account for carbon accumulation as well as carbon loss due to harvest, fire, insects, disease, and other carbon losses.

Can I get credits for long-lived wood products?
Yes, land owners can receive carbon credits for long-lived wood products if there is sufficient and verifiable documentation on harvested timber going into long-lived wood products.

What happens if I have signed an Afforestation contract, and I need to thin my stand?
If you have entered into an Afforestation contract and then come to a point in time that you need/want to thin your enrolled stand of trees, you will be allowed to transition out of the Afforestation provisions of the contract and into the Sustainably Managed Forest provision of the contract. It is very important that the land owner transition to a Sustainably Managed Forest contract prior to thinning an Afforestation stand of trees. If the land owner does not transition to a Sustainably Managed Forest contract, then they will be out of compliance if they thin their Afforestation stand of trees.

Are any credits I earn held in reserve?
Yes, the CCX requires that upon registration, 20 percent of your earned credits by held in reserve. Credits remain in reserve for five years after which they are released into the sellable pool of credits.

What happens if I am go out of compliance with my XFO contract?
If you go out of compliance with your XFO contract, a credit recovery process is required. That is, you will be required to replace all credits earned to-date under the contract. You can replace or recover credits using reserve credits and purchased credits.

What happens if some or all of my enrolled trees are destroyed by fire, insects, or some other natural disaster out of my control?
In the case of a natural disaster (i.e., fire, wind, insect damage, disease) that destroys all or part of your enrolled trees, your risk is limited to credits that you have held in reserve. Your reserve credits will be used to replace lost credits due to natural disaster but if you do not have enough credits in reserve then reserve credits from your pool are used to replace your lost credits. The XFO pool that you are in uses the pools reserve credits to “self insure” against natural disaster losses in the pool.

In any event, the credit recovery for losses due to events beyond the control of the land owner is limited to forfeiture of credits held in the reserve account.

How much will I get paid?
AgraGate will sell the aggregated carbon credits on the CCX board at the time of its choosing. The exact amount depends on market conditions at the time of the sale. In December of 2007, prices traded under $2.00/credit. Recently, in April of 2008, prices are trading over $6.00/credit. Prices go up or down on a daily basis. When AgraGate makes net proceeds distributions to land owners, fees are deducted. AgraGate Climate Credits Corporation retains 10 percent of the gross revenue and an additional 10 percent of net revenue is deducted if an Associate Aggregator is involved in the project. In addition, CCX fees are subtracted (currently $0.20 per credit) and verification fees are also subtracted. Verification fees will vary but will likely range from $0.20 to $0.25 per credit.
When will I get paid?
Currently, payments are made twice per year – in July and December.

What if some other exchange comes along in the next five years that will pay me more?
For the period covered by this contract, the credits will be registered and traded through the CCX. New members are joining the CCX on a regular basis and it is hoped that new buyers will participate in the CCX market. You will not be allowed to register the same credits on more than one exchange.

Why sign now? I’ll wait for more money from someone else.
There may never be a “someone” else. It is highly unlikely that future programs will recognize credits for activities in previous years that have not been registered or verified.

What are the upfront costs to the land owner?
AgraGate does not require payment of any “up front” costs for participants in our XFO program. Associate aggregators and/or forest service providers working with AgraGate may charge a fee for forest cruise or other services.

Can I sell land that I have enrolled in the XFO program?
Under CCX rules, if XFO-enrolled land is sold to another party, the XFO contract can be transferred to the new land owner. If the new land owner refuses to enter into an XFO contract, the contract will be considered out of compliance.

Will my enrolled land be subject to an audit?
Once per year, 10 percent of all XFO contracts will be selected for an on-site verification audit. If you are selected, you will be contacted and informed about when the on-site verification visit will take place.

How does the annual certification work?
Each year, participant land owners will be sent certification forms to be completed and returned to AgraGate. Participants will certify that their enrolled land is still in compliance. If acreage adjustments are needed, those adjustments will be indicated on the certification forms. Also, the participant will report any harvest activity on the certification forms.
AgraGate Climate Credits Corporation
Carbon Credit Program
Exchange Forestry Offset Contract

Forestry Offset Sales Contract v080205
Statement of Intent to Maintain Forest Carbon Stock Beyond 2010
Forestry Offset Enrollment Worksheet
Forestry Offset Application Checklist
APPLICATION FOR PARTICIPATION IN FORESTRY OFFSET POOL and SALES CONTRACT for EXCHANGE FORESTRY OFFSETS (XFOs)

If you have questions, call AgraGate at 866-633-6758

Mail Application to:
AgraGate Climate Credits Corp
5400 University Ave
West Des Moines, IA 50266

Associate Aggregator

Contract Number V080205
(Office Use Only)

Name

XFO-_____________________

Seller First Name and Last Name
Business Name (if applicable)
Date

Address
Phone

City, State, Zip
Cell

E-mail
Fax

I, ____________________________, hereby apply for participation in a forestry carbon pool managed by AgraGate Climate Credits Corporation (Purchaser or Aggregator) to register Exchange Forestry Offsets (XFOs) with the CCX (CCX) for the years 2008-2022 on acres of property that I own or control. I hereby attest that I hold full legal title to the Greenhouse Gas mitigation rights registered as CCX Offsets that are associated with the facilities and sites included in the registered project. I hereby agree that the forest project has as a primary purpose the long-term storage of atmospheric carbon in accordance with the CCX terms of participation and that the owner(s) of the enrolled forested lands agree to maintain such lands in compliance with the principles and practices of sustainable forestry production systems for a minimum of 15 years from the date of this contract in accord with the CCX protocols. The quantity of XFOs to be issued to a CCX-registered forestry project shall be based on the net changes in forest carbon stocks from the baseline year expressed in metric tons of carbon dioxide equivalence on eligible sites included in the project during years the 2008 through 2022. In addition, projects that meet all eligibility requirements may also be issued XFOs for the years 2003 through 2007. I further agree that I will abide by the rules of the CCX as they pertain to XFOs and to the conditions for Pool participation as set forth in this Agreement.

Purchaser agrees to buy and seller agrees to sell and deliver to purchaser free from liens and encumbrances at 5400 University Ave, West Des Moines, Iowa, the rights to the Exchange Forestry Offsets (XFOs) created during the terms of this contract on land located at: (See Forestry Enrollment Worksheet)

Seller agrees that the XFOs registered on the CCX through this contract shall be in compliance with the rules of the CCX at the time of credit registration and will abide by the rules for participation in the forestry carbon pool as set forth by this contract. In the event that the project fails to meet these requirements, all XFOs from such land shall be null and void and any payments for XFOs delivered prior to the end of this contract shall be repaid subject to interest and penalties as provided in this agreement.

The transfer price of the XFOs covered by this contract shall be the sales price as determined by sale through the CCX less a 10% service fee retained by AgraGate Climate Credits Corporation. Contracts facilitated by an Associate Aggregator will be subject to an additional 10% service fee which will be paid to the Associate Aggregator. Exchange offset registration and trading fees and offset verification costs are the responsibility of the offset project owner. Offset registration fees will be deducted from pool proceeds prior to payment calculations.

Sale of XFOs covered by this contract shall be at the sole discretion of the Purchaser, however all XFOs shall be priced no later than 180 days after the end of the contract period. Purchaser makes no warranty as to the market value of any qualifying XFOs created by Seller hereunder. Payment for XFOs covered by this contract shall be made on a semi-annual basis after pricing of the XFOs through the CCX. The parties to this contract hereby agree that the title to the XFOs shall be automatically delivered to the Purchaser on the first day of January following the year in which sequestration occurs. Seller further warrants compliance with all terms and conditions hereinafter contained in this Agreement for the period from January 1, 2008 through December 31, 2022.

Date
Seller’s Signature

Date
Purchaser’s Signature,
AgraGate Climate Credits Corp

Disclaimer: The Chicago Climate Exchange (CCX) is not currently scheduled to accept XFO’s for registration past the calendar year 2010. In the event XFO’s which would be registered in 2011 and beyond cannot be registered with the CCX, the parties’ duties under this Agreement shall be altered as provided for under the Terms and Conditions section herein.
Terms and Conditions

CCX Offset Project Terms and Conditions: By registering a project with CCX, each project owner (i.e., Seller) agrees to and acknowledges the following Terms and Conditions in relation to the project and the Exchange Offsets issued by CCX:

1. The enrolled project meets all applicable eligibility and compliance rules of the CCX, which are incorporated herein by this reference. A copy of the relevant CCX rules applicable to XFOs may be accessed at agragate.com
2. CCX will issue to the CCX Registry account of the project owner or its designated aggregator a quantity of Exchange Offsets that conforms to the applicable CCX Rules. Project owners will be notified of acceptance/rejection of their XFOs into the CCX registry account by the designated aggregator at or before the time of the first payment due the Seller hereunder.
3. Each sale of Exchange Offsets executed through the CCX shall represent a complete transfer of all legal rights associated with the mitigation of greenhouse gases that relate to the quantity and time periods associated with the Exchange Offsets that are established through fulfillment of the Terms of this contract.
4. The project owner or its CCX-registered aggregator may sell or retain the Exchange Offsets earned under the provisions of this agreement.
5. Exchange offset registration fees and verification costs are the responsibility of the offset project owner and will be deducted from the net proceeds of the pool before payments are made from the pool.
6. The project owner shall retain full legal ownership of all greenhouse gas mitigation rights that may accrue: (a) on lands or via activities not included in the CCX-registered project; (b) in excess of the quantity of Exchange Offsets issued by CCX to CCX-registered projects; (c) before or after the years 2008 through 2022 for the CCX-registered project.
7. CCX makes no warranty as to the marketability or market value of CCX Exchange Offsets.
8. Each project owner, and, when applicable, its aggregator, is required to periodically submit a signed project report that confirms conformance with the terms herein. Representatives of CCX may conduct on-site inspection of registered projects and related documents. Each project owner agrees to provide access in such cases in a prompt and cooperative manner. All CCX offsets projects and project reports and verification reports are subject to inspection and audit by the provider of regulatory services designated by CCX and by other independent experts as may be engaged by CCX.
9. CCX may request additional information and/or access to registered projects for the purpose of advancing understanding of greenhouse gas mitigation projects. Project owners may decline such access without penalty. In no cases shall research findings cause a reduction in the quantity of Exchange Offsets to be issued to a registered project.
10. Failure to conform to the rules provided herein may result in termination of enrollment in CCX and prohibition from all further participation in CCX.

CCX Eligibility Requirements: Projects that are represented in CCX by an Aggregator are referred to as “pooled projects.” The “pool” refers to the multiple projects represented by the Aggregator. Each aggregator is assigned a CCX registry account which will hold all offsets issued to projects it represents. Aggregators shall also be Authorized Traders in the CCX Trading Platform for such offsets. Aggregators shall be responsible for receiving from individual projects the CCX-required project reports, and for submitting to CCX summary reports of projects they represent.

Verifier: Is a technically expert entity that is approved by CCX to conduct verification of CCX Exchange Offset projects. CCX Forestry Pool participants agree that a CCX-approved verifier may have access to the land and facilities covered by this contract and to conduct activities to verify CCX Exchange Offsets.

Offset Issuance: CCX-eligible greenhouse gas mitigation projects can be recorded in the CCX Registry and may be issued Exchange Offsets on the basis of mitigation tonnage realized during the years covered by this contract and for earlier vintage years that meet applicable exchange requirements. All offset project mitigation effectiveness will be quantified on the basis of metric tons of CO₂ equivalence. Each Exchange Offset will represent one hundred metric ton of carbon dioxide (CO₂) and will be identified by annual vintage. These are called Carbon Financial Instruments (CFIs).

Vintage: The vintage of an instrument is defined as the first year the designated instrument may be used for compliance with the CCX emission reduction schedule, or, as applicable, the CCX electricity purchase reduction schedule.

Trading Authority: AgraGate Climate Credits Corp. shall have sole authority to access the CCX Trading Platform and Registry account(s) holding the offsets issued to projects it represents and AgraGate Climate Credits Corp. to execute sales on the CCX electronic trading platform on behalf of project owners and distribute sales proceeds to project owners in accordance with the terms stated in this contract.

Falsification of Certification Report: A project owner who files a false certification report shall be subject to (1) replacement of any nullified credits; (2) loss of any claim to credits held by the reserve pool; and (3) shall also pay to the aggregator, a penalty equal to twenty percent (20%) of the value of all offsets or allowances covered under this Agreement, as well as interest accruing on said amounts from the date of noncompliance, as well as all costs incurred by aggregator in enforcing this provision, inclusive of reasonable attorney fees. The owner of the noncompliant project may be prohibited from further participation in CCX.

Afforestation projects: Afforestation projects in CCX-eligible areas that involve new plantings of trees (or natural regeneration) that occurs after Dec 31, 1989 on land that was non-forested prior to December 31, 1989 may quantify carbon sequestered in eligible forests through direct measurement by a CCX-approved protocol or through use of the CCX Carbon Accumulation tables for the vintage years 2003 through 2022. The CCX Forestry Committee may recommend modifications to the tables. Similar tables may be developed for other regions of the world. Forest carbon stocks may not be reduced by harvest or thinning as part of the afforestation quantification methods. Before forest carbon stocks are subjected to harvest or thinning, the tract must comply with the provisions of the “Harvest Option and Protocol for Sustainably Managed Forests” contained in this document and in accord with CCX protocols.

Carbon quantification through direct measurement methods: Direct measurement of forest carbon must be verified by a CCX-approved verification entity that shall use the CCX-recognized forest carbon direct quantification methods in a manner consistent with the provisions herein. The cost of verification of such direct measurements will be borne by the project owner. Issuance of XFOs based on annualized gross carbon accumulation estimates calculated using the method shall occur at a rate that is 90% of the central estimate of annual carbon accumulation calculated through application of CCX-recognized forest carbon direct quantification methods (i.e. a 10% discount is applied). The elected quantification method shall be employed for all years during the contract period.

Included Carbon Pools: Net changes in carbon stocks shall be quantified on the basis of increases in above ground and below ground living biomass occurring on lands included in the CCX project. The above-ground living biomass carbon pool includes stem wood, stem bark, and branches. The below-ground living biomass carbon pool includes coarse roots. In addition to the terms and conditions established in this document, in all cases project owners (or, as applicable, the ultimate owner of carbons sequestration rights associated with forest land included in a CCX project) shall retain ownership rights for all sequestration occurring in any excluded carbon pools.
Harvest Option and Protocol for Sustainably Managed Forests:

1. All privately owned, forested lands are eligible for the sustainably managed forest program. Project owners and aggregators must provide evidence of sustainable forest management of all their managed forest land through certification from agencies or schemes that have been endorsed by the PEFC1 (e.g. SFI), the Forest Stewardship Council, or other certification programs approved by the CCX Committee on Forestry. A complete list of CCX approved certification schemes is available in the CCX Rule Book, Annex I Carbon Financial Instruments may be issued retroactively prior to obtaining certification for sustainable management provided that sustainable certification exists when the project enrolls in CCX.

The PEFC Council (Programme for the Endorsement of Forest Certification schemes) is an independent, non-profit, non-governmental organization, founded in 1999 which promotes sustainably managed forests through independent third party certification.

2. Project owners and aggregators may earn XFOs issued for managed forest projects on the basis of verified documentation for the net changes in carbon stocks (expressed in metric tons of carbon dioxide) on eligible sites included in the project during each of the years between the establishment of the baseline through the end of the contract. The net change in carbon stocks is defined by the equation: Net change in Carbon Stocks = (increases in Carbon Stocks due to growth) minus (the quantity by which Carbon Stocks decreased due to harvest, pest, fire and adverse weather events). If an offset provider or aggregator reports for the calendar year a net decrease in Carbon Stocks from the previous calendar year, the project owner or aggregator must surrender Carbon Financial Instruments in an amount reflecting net decreases in Carbon Stocks from the previous year. Offset providers or aggregators may use banked allowances for compliance in this situation.

3. Payments to aggregated sustainably managed forestry pool participants will be based on the project’s percentage net contribution to pool XFOs over the life of the contract. Interim payments will be based on the calculated average net contribution to the pool.

4. Quantification of net changes in forest carbon stock must involve a Model-based Accounting Approach. Guidelines for Model Based Accounting approach are presented in Chapter 8 section 8.4 of the CCX Rulebook. Managed forest projects will be issued or debited CCX CFI’s on the basis of verified net annual change in forest carbon stocks through the CCX Market Period (2003-2022). Growth and yield Model estimates of net annual changes in carbon from forest project will be discounted to account for variance in model estimates by the minimum of 20% or two times the reported statistical error (The statistical error (E) is defined as the difference between the mean carbon sequestration (X) and the lower confidence limit value (LCL) divided by the mean carbon sequestration (X). Thus, E=(X-LCL)/X.) of the baseline inventory data. Forest inventories, that will be input into the growth-and-yield model to estimate annual carbon sequestration, must have a 90% confidence interval at a minimum for the estimated mean wood volume. All managed forest projects are subject to approval of the CCX Committee on Forestry. No discount will be applied for instances when in-field inventories are conducted on an annual basis. Inventories conducted on an annual basis must also have a 90% confidence interval at a minimum.

5. The quantification of changes in carbon stocks will be adjusted to reflect acquisition or disposition of forest land on an annual basis as outlined below: a) When forested land is acquired, the enrolled landowner may include eligible forest carbon accumulation provided that it meets all of the criteria set forth in this document. When forest parcels are purchased, the carbon stocks on the purchased forest are not counted as growth for the year they are purchased, but are added into the baseline so that the net growth may be calculated in the subsequent year. b) If forested land is disposed by a land owner, then the offset provider or aggregator will be penalized by the total amount of offsets issued by CCX for sequestrated carbon from those acres for entire length of time that the land has been enrolled in the program. However, disposed land from one pooled participant to another pooled participant that is also enrolled within CCX will not be penalized in this fashion. Under such conditions, a transfer of credits from one offset provider to another may be required. In the case of a transfer of credits from AgraGate to another aggregator, a transfer fee of 10% of the value of the credits transferred will be imposed.

6. Database records, model inputs and all enrolled land are subject to third party verification requirements by CCX-approved verifiers. If an enrolled participant’s project land does not conform to the managed forest offset performance requirements, such event shall be promptly reported to CCX (such reporting shall occur through a project’s aggregator if the project is registered through an aggregator). CCX will then cancel all CCX CFI’s in an amount equal to the quantity of forest offsets previously issued to the project. The owner of the non conforming forest project shall be prohibited from further participation in CCX.

7. Baseline: Project participants must establish a baseline of forest carbon stocks for purposes of calculating net changes in forest carbon stocks and subsequent issuance of CFIs. Once established, this baseline will serve as the reference year for all purposes in the managed forest project during the CCX market period. The baseline is established as the biomass level in the enrolled parcels on December 31 of the year preceding their eligibility for enrollment. Participants are eligible to earn CFI’s based on verified documentation of net changes in forest carbon stocks from the baseline year. Project proposal filing must present sufficient data on forest inventories and management activities on enrolled forest land while establishing the baseline. Baselines are subject to audit by a CCX approved verification agency. The commitments and obligations of the seller that are created by this contract terminate (regardless of vintage) if the project ceases to accept XFO’s for registration in any given year during the term of this Agreement, both Seller and Purchaser shall be relieved of any duties or obligations as provided under this Agreement as it relates to XFO’s for the year which is not able to be registered, and all subsequent years remaining under the terms of this Agreement. Fulfillment of Obligations: The commitments and obligations of the seller that are created by this contract terminate December 31, 2022.
TO: CHICAGO CLIMATE EXCHANGE

This Statement of Intent issued by __________________________ (“Enrolled Participant”), to Chicago Climate Exchange (“CCX”) confirms Participant’s intent to respect the Principle of Permanence regarding its forest carbon stock to maintain beyond December 31, 2010, excluding catastrophic events and land sales, the quantity of Carbon Stocks held by the Participant in its CCX-registered Afforestation Offset Project as defined in Chapter 9 of the CCX Rulebook including any amendments and/or interpretations thereto.

It is recognized by Participant and CCX that this is a non-binding Statement that reflects the Participant’s intent in regards to the issues described herein.

The Participant acknowledges that the effectiveness of forest stocks in sequestering carbon dioxide depend on the forests stocks being maintained for a considerable time period. The Participant acknowledges that an objective of the CCX is the development of protocols to advance climate change mitigation objectives and that the Chicago Climate Exchange issues offsets for forest carbon stocks with the objective that the forest stocks sequester carbon for a considerable time period. The Participant acknowledges that they support the objectives of the CCX and the use of forest offset projects as a means of carbon sequestration.

Dated this ______ day of ______, 2008.

By: __________________________

Name: __________________________

Title: __________________________
# Exchange Forestry Offset Enrollment Worksheet

Complete an Enrollment Worksheet for each stand associated with this contract.

<table>
<thead>
<tr>
<th>Associate Aggregator name</th>
<th>Stand No.</th>
<th>Worksheet No.</th>
<th>Contract No. (Office use only)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>XFO-</td>
</tr>
</tbody>
</table>

## Seller Name

<table>
<thead>
<tr>
<th>First Name and Last Name and/or Business Name</th>
<th>Share</th>
</tr>
</thead>
</table>

## Additional owners (if any)

<table>
<thead>
<tr>
<th>Name</th>
<th>Street address</th>
<th>City</th>
<th>State</th>
<th>Zipcode</th>
<th>Share</th>
</tr>
</thead>
</table>

## Stand Information

<table>
<thead>
<tr>
<th>State</th>
<th>County/Parish</th>
<th>Name of Survey (TX)</th>
<th>Abstract Number (TX)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Name of Township</th>
<th>Township No. (e.g. T72N)</th>
<th>Range No. (e.g. R22W)</th>
<th>Section No. (e.g. 28)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Acres of trees in Stand</th>
<th>Legal description</th>
<th>Longitude and Latitude (Degrees, minutes, &amp; seconds)</th>
</tr>
</thead>
</table>

### Property Ownership documentation

- Deed of Trust
- Title insurance document
- Sales contract
- Abstract appropriate pages
- Tax receipts
- Other

### Description of forest stand

- Tree species: _________
- Planting date: _________
- Site index: _________
- Trees/acre currently: _________

## Project type

- Afforestation
- Sustainably Managed Forest

### Afforestation project information

(Complete the information below for Afforestation projects)

- Status of Stand prior to planting trees
  - Cropland
  - Grassland
- CO2 quantification method to be used
  - CCX tables
  - Direct measurement
- Documentation check list (check if included with application)
  - Photo prior to planting
  - Evidence of planting date

### Sustainably Managed Forest project information

(Complete the information below for Sustainably Managed Forest projects)

- Sustainable Forest Certification
  - PEFC (SFI)
  - Tree Farm System
  - Forest Stewardship Council (FSC)
  - Other

### Cruise information

(Complete the cruise information below for Afforestation projects using direct measurement and for Managed Forest projects)

- Cruise type and date
  - Baseline _________
  - Interim _________
  - True-up _________
- Volume type
  - Basal area
  - Volume
- Sampling method
  - Fixed radius
  - Point sample (Prism)
- Statistical precision
  - % error
  - Plots/Stand
- Sampling technique
  - Compass
  - GPS

### Anticipated harvest/thinning:

- No harvest or thinning expected over life of the contract
- Harvest/thinning expected at age _________ with _________ % of timber removed

If the stand is harvested or thinned, the expected disposition of wood products is as follows:

- _________ % softwood sawlogs
- _________ % softwood pulpwood
- _________ % hardwood sawlogs
- _________ % hardwood pulpwood
- _________ % other

### Growth and Yield model

<table>
<thead>
<tr>
<th>FVS</th>
<th>SIMMS</th>
<th>Twigs</th>
<th>CO2FIX</th>
<th>Other</th>
</tr>
</thead>
</table>

### Baseline Volume:

- (Enter the volume estimate from the Growth and Yield model and convert to MT CO2/acre).
  - _________ green tons/acre x 0.50 = _________ dry tons/acre x 0.50 = _________ tons C/acre x 3.67 = _________ tons CO2/acre x 0.9074 = _________ MTCO2/acre
Complete an Enrollment Worksheet for each stand associated with this contract.

<table>
<thead>
<tr>
<th>Associate Aggregator name</th>
<th>Stand No.</th>
<th>Worksheet No.</th>
<th>Contract No. (Office use only)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>XFO-</td>
</tr>
</tbody>
</table>

**Cruise tally sheet** (Complete this cruise tally sheet for Afforestation projects using direct measurement and for Managed Forest projects)

<table>
<thead>
<tr>
<th>Plot Number</th>
<th>Tree number</th>
<th>Species (use FVS species code)</th>
<th>Diameter at breast height (DBH)</th>
<th>Total height</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>
Items to be submitted for Forestry Offset Application

Check the boxes next to documents being submitted with the application

1. Signed Exchange Forestry Offset (XFO) Contract
2. Completed Forestry Offset Enrollment Worksheet
3. Farm Service Administration (FSA), Forest Service, or NRCS aerial maps of enrolled areas
4. A voided check from your checking account so that we can set up electronic transfer of funds
5. Legal description of land included in the forest Project (one or more of the following):
   - Covered by information in AgraGate Forestry Contract
   - FSA or Forest Service maps with legal description
   - Deed, Title Insurance
6. Identity of the land owner(s):
   - Covered by information in AgraGate Forestry Contract
7. Legal evidence that the Project land is owned by the Project Owner or, in instances where the Project owner is not the landowner, evidence that the CCX Forestry offsets to be generated by the Project are legally owned by the Project Owner (one or more of the following):
   - Copy of Deed of Trust
   - Copy of Sales Contract document
   - Copy of tax receipts
   - Copy of Title Insurance document
   - Copy of appropriate abstract pages
8. Documentary contractual evidence between the aggregator and landowner that Project lands will remain as forest stock for at least 15 years:
   - Covered by AgraGate Forestry Contract
9. Evidence of intent to maintain forest carbon stock:
   - Signed Statement of Intent to Maintain Forest Carbon Stock Beyond 2010

Additional documentation needed under the Afforestation provisions:

10. Evidence that trees were planting on land that previously had no trees:
    - Aerial photos of property prior to planting
    - Copy of CRP contract
11. Evidence of planting date:
    - Tree purchase receipts
    - Copy of CRP contract

Additional documentation needed under the Manage Forest provisions:

12. Description of sustainable forestry management plan:
    - Copy of signature page of sustainable forestry management plan
    - Baseline cruise records
    - Copy of sustainable certification document
13. Evidence of Sustainable Certification:
    - Copy of Sustainable Certification certificate
14. Direct measurement data:
    - Stand cruise records
Carbon sequestration is the process through which agricultural and forestry practices remove carbon dioxide (CO₂) from the atmosphere. The term “sinks” is also used to describe agricultural and forestry lands that absorb CO₂, the most important global warming gas emitted by human activities. Agricultural and forestry practices can also release CO₂ and other greenhouse gases to the atmosphere.

Sequestration activities can help prevent global climate change by enhancing carbon storage in trees and soils, preserving existing tree and soil carbon, and by reducing emissions of CO₂, methane (CH₄) and nitrous oxide (N₂O). For more information on the science, emissions, and reduction opportunities for these and other non-CO₂ gases, please visit our non-CO₂ gases page.

This Web site provides information on the following, and more:

- Frequently asked questions (FAQ) about carbon sequestration
- Agricultural & forestry practices that sequester carbon and reduce other greenhouse gases
- Basic science background
- U.S. national analysis on current sequestration rates, and the potential for additional sequestration and greenhouse gas reductions in agriculture and forestry
- Project analysis to estimate the climate benefits of agricultural and forestry projects
- International sequestration opportunities
- Environmental co-benefits of sequestration practices
- Tools and resources produced and supported by EPA, and other useful references

New EPA Technical Report
Greenhouse Gas Mitigation Potential in U.S. Forestry and Agriculture

View the graphical version of this page at: http://www.epa.gov/sequestration/
## Forestry Practices that Sequester or Preserve Carbon

<table>
<thead>
<tr>
<th>Key Forestry Practices</th>
<th>Typical definition and some examples</th>
<th>Effect on greenhouse gases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afforestation</td>
<td>Tree planting on lands previously not in forestry (e.g., conversion of marginal cropland to trees).</td>
<td>Increases carbon storage through sequestration.</td>
</tr>
<tr>
<td>Reforestation</td>
<td>Tree planting on lands that in the more recent past were in forestry, excluding the planting of trees immediately after harvest (e.g., restoring trees on severely burned lands that will demonstrably not regenerate without intervention).</td>
<td>Increases carbon storage through sequestration.</td>
</tr>
<tr>
<td>Forest preservation or avoided deforestation</td>
<td>Protection of forests that are threatened by logging or clearing.</td>
<td>Avoids CO₂ emissions via conservation of existing carbon stocks.</td>
</tr>
<tr>
<td>Forest management</td>
<td>Modification to forestry practices that produce wood products to enhance sequestration over time (e.g., lengthening the harvest-regeneration cycle, adopting low-impact logging).</td>
<td>Increases carbon storage by sequestration and may also avoid CO₂ emissions by altering management. May generate some N₂O emissions due to fertilization practices.</td>
</tr>
</tbody>
</table>

Representative sequestration rates and saturation periods for key forestry practices.
Florida farmers, foresters could profit from the global-warming fight, a study finds

Kevin Spear
Sentinel Staff Writer
April 30, 2008

The fight against global warming could make the state a greener place and fatten the wallets of farmers and foresters, a University of Florida study has found. Most of an estimated $465 million a year in economic benefits would come from so-called "offsets," payments that power companies and other industries nationwide might soon be forced to make as compensation for greenhouse gases they release into the atmosphere. The money could be used to sow acres of forests, make bio-fuels or encourage the state's $101 billion-a-year agricultural industry to change its practices to counteract global-warming pollution. Florida's year-round growing season makes it ideal for such initiatives, the study says.

The windfall all would depend on laws now pending before Congress or on state partnerships set up for what's also known as carbon trading. Experts predict the money should start flowing within a few years.

"It's combining the ethical imperative of global warming with market opportunity," said UF professor Stephen Mulkey, who led the study.

The environmental advocacy group Environmental Defense paid $75,000 for the study but did not have a part in research, said Mulkey, also a senior adviser to the Century Commission for a Sustainable Florida. Scientists from around the world fear that increasingly high levels of greenhouse gases are dangerously warming the planet. They're most alarmed about carbon dioxide spewed by cars, power plants and industries that burn coal or oil.

Florida industry could play a key role in offset trading because much of its electricity is generated by such fossil fuels. In Central Florida, the Orlando Utilities Commission relies mostly on coal, one of the biggest sources of carbon-dioxide pollution. Offsets also would give companies an incentive to clean up their acts. They could avoid paying at least some of the money by adopting better anti-pollution technology at their plants.

Benefits for Florida could multiply, Mulkey said, if additional income for farmers and foresters...
from the offsets keeps them from selling land for development. "Concrete does not sequester carbon, and new homes don't sequester carbon," Mulkey said.

It may take years for the nation to embrace clean-energy sources, ranging from solar to nuclear. Florida Agriculture Commissioner Charles Bronson said the state's agricultural industry has a wide variety of ways to tap revenues from offsets. "I'm looking forward to Florida being a major player," Bronson said.

Early offset systems already are starting to emerge. Owen Hughes, a land-conservation consultant, is negotiating a deal that would earn cash for a 350-acre forest tract in Volusia County. The money would come through the Chicago Climate Exchange from voluntary offset payments by industry. "This is literally a trial run and one of the first in Florida," Hughes said.

Fighting global warming will be difficult, partly because of disagreements about how to do it. One example is whether nuclear power, which emits relatively small amounts of greenhouse gases, should play a key role. Opponents say no because of risks with radioactive fuel.

But even the idea of involving forestry and agriculture draws controversy. The rules promise to be enormously complicated. The Sierra Club argues that offsets should focus on carbon in the air right now. "What we don't agree with is to use those measures to offset new emissions of carbon," said Bruce Nilles, Sierra's national coal campaign director, who instead advocates better anti-pollution technology.

But the threat of global warming is too pressing to wait for new technologies, said Jerry Karnas, climate-project director for Environmental Defense in Florida.

"Those offsets are a bridge to the future," Karnas said.

Kevin Spear can be reached at kspear@orlandosentinel.com or 407-420-5062.

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Companies and national governments are moving forward in developing mechanisms to reduce greenhouse gas ("GHG") emissions and conducting private party-to-party trades of these reductions, despite the failure to reach final agreement on the Kyoto Protocol at COP-6 last November. For companies whose businesses involve high levels of GHG emissions, there is little doubt that future obligations will be placed upon them to reduce those emissions. The costs associated with obtaining such reductions in developed countries may be prohibitive when compared to the costs of purchasing credits in a market or achieving emission reductions from projects in developing countries. For companies with emissions-reducing technologies, or who are undertaking projects that by their nature reduce emissions, significant opportunities exist. Where clear emission reductions can be demonstrated, the potential to create tradable units of emission reductions may prove to be enormous. However, the question of how to create a tradable unit prior to ratification of the Kyoto Protocol remains.

By structuring current projects pursuant to the framework already agreed upon by the Parties, project participants enhance the probability that emission reductions will be certified when an international legal regime comes into force. Under the Kyoto Protocol, certain projects that reduce GHG emissions result in the creation of Certified Emission Reductions ("CERs") and Emission Reduction Units ("ERUs"), more commonly referred to as carbon or emission credits. These include Joint Implementation ("JI") projects (between developed countries) and Clean Development Mechanism ("CDM") projects (between developed and developing countries). Provided that JI and CDM projects result in emission reductions beyond what would otherwise be required, and provided they meet the other requirements of Articles 6 and 12, the resulting emission reductions may be verified and certified by an accredited entity and utilized in meeting legal limitations or traded to another entity.

In the absence of ratification of the Kyoto Protocol, no specific legal regime exists that creates carbon credits. The Parties and the working groups established under the Kyoto Protocol are still developing the rules for an international trading regime. At the same time, a number of national governments are evaluating or developing their own domestic trading systems. However, the most significant influence on market design emerging is the early private-to-party trading of emission reductions. Entities such as BP Amoco, Shell, Ontario Power Generation, Trans Alta, Tokyo Electric Power Company, Dupont, NSW State Forests and the Dutch Government have been making headlines by reducing carbon emissions, trading these reductions internally, supporting external carbon emission-reducing projects or purchasing the resulting emission reductions. Currently, parties engaging in this early trading are establishing carbon credits through private contracts dealing with the issues of ownership, transferability and risk associated with credit certification.

In considering early trading opportunities, companies should recognize that emission reductions achieved now are more likely to be validated under the Kyoto Protocol and

http://www.emissions.org/publications/emissions_trader/0103/carboncredits.html
issued CERs if the participants follow the guidelines already developed and agreed to by the COP. For instance, the Parties have agreed upon the basic framework of a CDM project. This framework requires a project to be undertaken by a developed country (or an entity within such country) in a developing country with voluntary approval from both countries. Also under the framework, an Executive Board would issue CERs only after validation and certification of the emission reductions by an accredited operational entity. Although no Executive Board exists and no operational entities have been accredited, the Parties have agreed to accreditation requirements for an operational entity. The Parties have also established criteria for validation and certification, including substantial monitoring requirements and review of the project’s impact within and outside of boundary lines, including any leakage impacts.

Although CERs will not exist unless and until the Kyoto Protocol comes into force, opportunities for creating and trading emission reductions exist today. Using an operational entity that would meet the established accreditation criteria and following the guidelines for independent certification increases the likelihood that any emission reductions will eventually be validated. When trading, entities may also utilize contract provisions to address the risk that the credits may never become certified and may even be able to obtain insurance against these risks.

Tracey L. Mihelic
Tracey Mihelic is a Partner in Baker & McKenzie’s Chicago Office and is responsible for the U.S. arm of the Firm’s Climate Change and Emissions Trading Practice. Tracey participated in the development of the nitrogen oxide emissions trading program for the Midwestern states and in the establishment of the volatile organic material emission trading system in Illinois. She also has advised clients regarding the legal issues associated with constructing new operations that require the retention of emission offsets in non-attainment areas for specific air quality standards. Tracey participated as a delegate to the EMA at COP6.

Martijn Wilder
Martijn Wilder is a Partner in Baker & McKenzie’s Sydney Office and is responsible for the Australasian arm of the Firm’s Climate Change and Emissions Trading Practice and is also responsible for the Australasian arm of the firm’s public international law practice. In addition, he is a member of the firm’s projects and energy practice, where he specializes in domestic and international environmental law and assists on major projects. Martijn also advises key corporate clients on matters of Corporate Responsibility.