

# THE TRANSATLANTIC TRADE IN WOOD FOR ENERGY:

*A Dialogue on Sustainability Standards and Greenhouse Gas Emissions*



Savannah, Georgia  
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Workshop participants on the field study tour in southeast Georgia.

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**Workshop proceedings are available at:**  
**[www.Pinchot.org/pellets](http://www.Pinchot.org/pellets)**

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### Introduction

#### **Increasing Trade, Increasing Dialogue**

Bioenergy represents nearly 80% of renewable energy produced globally and the share of energy coming from biomass is projected to remain high for the foreseeable future (IPCC, 2011). Desire to reduce fossil fuel consumption and associated greenhouse gas emissions is driving policy such as the European Union (EU) goal for producing 20% of its energy with renewable resources by 2020. A host of incentives and subsidies is accelerating European demand for biomass which is expected to amount to 37–44 million metric tons of wood pellet equivalents for co-firing by 2020 (Lamers et al., 2013). An expanding transatlantic trade in wood pellets is a direct result. In 2013, the US will export nearly 3 million bone dry tonnes of wood pellets. As much as 20 million tonnes is expected to be imported by the EU by 2020,<sup>1</sup> with at least one projection suggesting that as much as 60 million metric tonnes of biomass—mostly wood pellets from the southeastern US and Canada—could be imported annually to the EU out just beyond 2030 (Joudrey et al., 2012).

Given this rapid growth in the use of wood for energy, sustainable sourcing is a core focus of discussions amongst stakeholders. Both the energy and forest industries have long engaged in conversations with society at large concerning the sustainability of their function to produce material and energy resources for society. Many of these discussions have yielded improved understanding, new knowledge, and consensus visions, clarifying the way we think about and perceive complex sustainability issues.

A global wood pellet trade necessitates a much broader discussion about the design and implementation of sustainability criteria if these criteria are to be effective. There is a clear need for public dialogue concerning emerging “sustainability criteria” or market standards focused on the methods by which forest biomass is produced and procured by energy facilities, and the overall

#### **Savannah Workshop Format**

October 23–24, 2013

Blending classroom presentation and discussion with in-field learning offered a unique platform for improving the understanding of biomass sustainability within the US South. Five panel discussions explored:

- 1 Projected European biomass demand and the supply response in the US
- 2 Sustainability of the southern forest resource and sustainability issues in the regions’ private forests
- 3 The need for easily measurable and effective sustainability indicators
- 4 The need for parity between emerging sustainability policies from Europe and sustainability programs and practices in the US
- 5 A focused debate on the accounting of biogenic and combustion emissions

The field tour focused on biomass supply chains in southeast Georgia, touring industrial and non-industrial timberlands and a pellet mill sourcing low-grade pulpwood from both certified and uncertified lands.

greenhouse gas emissions effects of increased forest-based energy. Two workshops were recently convened to facilitate dialogue between stakeholders in key regions of the world active in the global trade in industrial wood pellets.

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<sup>1</sup> In 2013 the US is expected to export approximately 5.4 million green tonnes of wood pellets.



Brian Kehler

Savannah workshop panelists discuss biodiversity conservation strategies for the South.

### Stakeholder Workshops—Improving the Transatlantic Dialogue

In October 2012, several Canadian partners working with IEA Bioenergy Task 40 (*International Sustainable Bioenergy Trade*) and IEA Bioenergy Task 43 (*Biomass Feedstocks for Energy Markets*) and IEA Bioenergy ExCo facilitated a dialogue in Quebec, Canada around the design and implementation of sustainability criteria within the context of Canada’s forests (IEA Bioenergy, 2013).<sup>2</sup>

To explore these issues within the context of the US, the Pinchot Institute for Conservation and IEA Bioenergy Tasks 40 and 43 and IEA Bioenergy ExCo brought together more than 60 experts and stakeholders in Savannah, Georgia. Representing conservation organizations, government agencies, universities, and the forest and renewable energy industries in nine different countries, the workshop was organized to explore sustainable forest management (SFM) and the design and implementation of sustainability criteria within the context of the world’s largest wood pellet producing region, the southeast US. This report summarizes the perspectives and discussions offered by participants in the Savannah workshop. Major themes emerging include:

1. Sustainability is more than calculations of forest growth-to-drain.
2. There is a lack of clear understanding about how pellet demand may affect forest management, frustrating all stakeholders and raising questions about the sustainability of wood pellet export markets.
3. If the export market for pellets is to expand, European sustainability criteria need to be translated to the North American context for successful deployment.
4. There is a need to reconcile the intent behind the European Commission’s prohibition of biomass from wetlands with the legally permissible logging of certain wetlands in the US.
5. There is emerging agreement around the need to account for biogenic carbon and combustion emissions and principles to do so, but expectations vary significantly.

<sup>2</sup> The Quebec Workshop summary report is available here: <http://www.ieabioenergy.com/publications/the-science-policy-interface-on-the-environmental-sustainability-of-forest-bioenergy/>

## Background

### A Desire to Find Common Ground

The transatlantic trade in wood pellets is of strategic importance for all countries involved. While Europe could technically produce more of its own biomass, it would come at much higher prices than if resources are sourced from the US and Canada. Both of these exporting nations see an opportunity for economic growth but the context is quite different. For Canada, pellet export markets are sourced from mill residues associated with the removal of beetle-killed forests in British Columbia and may possibly be sourced from forest industry in the eastern provinces, virtually all of which occurs in the context of largely publicly owned and certified forests. In the US, wood pellet exports offer private landowners additional outlets for low-grade wood, providing an additional revenue source and reducing the incentive for conversion to non-forested land uses.

Europe and the US share common interests in establishing a substantial trade in wood for energy; this suggests there are strong incentives for identifying sustainability criteria approved by all parties. Yet, there is tension between European expectations for sustainability criteria and the

realities of what may constitute measurable and meaningful criteria for the US. There is a sense that greater international cooperation is necessary to ensure that sustainability criteria do not inadvertently erect barriers to trade or allow unacceptable environmental impacts.

At present, the policy environment around sustainability criteria is opaque. Belgium is the only EU member state that requires by law that solid biomass for energy must be produced sustainably. Since 2010, the European Commission (EC) has been considering binding criteria that would essentially set sourcing requirements for European buyers. It is however appearing increasingly unlikely that any mandatory criteria will be introduced within the next 1–2 years. Given this uncertain policy environment, EC member states such as the Netherlands and Denmark are considering their own country-level requirements. These proposals follow recent action taken by the United Kingdom (the single largest source of wood pellet demand) to make renewable energy subsidies contingent on facilities using and reporting on biomass procurement requirements by April 2014. By April 2015 this will most likely be required to qualify for subsidies.



A representative from one of the world's largest privately held power utilities converses with a forester working with one of the largest private landowners in the US.

Brian Kittler



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Longleaf Pine habitat in the foreground, adjacent to densely planted Loblolly Pine in the background.

All of these efforts focus on requirements for sustainable forest management and third-party verification. Other elements of proposed frameworks include requirements for:

- Documenting minimum GHG emission reductions
- Avoiding biomass from areas of “high biodiversity”
- Avoiding biomass from wetlands (as defined by the EU)
- Maintaining or increasing carbon stocks of source regions
- Documenting biomass chain-of-custody from the forest to the end consumer
- Verifying via a third party that biomass is “legal and sustainable”

The Savannah workshop sought to begin to clarify whether existing forest management and biomass procurement practices being used in the region satisfy the intent of existing and proposed sustainability criteria.

## Context of the Southern Forest System

Workshop participants saw first-hand what makes the southeastern US such a diverse region in forest type, ownership and culture. Almost 90% of the forestland (200 million acres) in the 13-state southern region is privately owned and governed by a complex mix of market forces, regulations, and voluntary incentive programs.

The region is a major player from a global fiber supply perspective; more than 60% of US timber is produced in this region of the number one timber-producing nation. The USDA Forest Service states that the region could support as much as a 40% increase in timber production from 2006–2007 levels (Wear & Greis, 2013).

However, it is important to acknowledge that only 17% of forests in the South are certified to a sustainable forest management standard. More than 53% of all acres enrolled in the American Tree Farm System (ATFS) are located in the South, and the region also has the largest concentrations of SFI certified lands in the US. The Forest Stewardship Council (FSC) has a relatively small amount of certified land in the region.

The industrial forest estate of the South includes around 40 million acres of intensively managed and highly productive native pine plantations, most of which are located in the coastal plain—the region of focus for the workshop study tour. While the growth in new plantation acreage has leveled off in most southern states in recent years, the USDA Forest Service speculates that the plantations may increase by 7–27 million acres by 2050 (Wear & Greis, 2013).

While a mix of market forces would shape such an expansion, workshop presenters surmised that an increase in plantations would be linked to increased demand for pine pulpwood for wood pellets. That said, the projected future loss of natural forests in the region is forecasted by at least one presenter to be only marginally associated with wood pellet demand, contrasting with concerns expressed by some environmental interests participating in the dialogue.

Forest loss to suburban development is perhaps the major sustainability issue facing the region, and the nation’s forests. Forest conversion is a major contributing factor for why in just a few decades US forests could transition from currently sequestering 12% of US CO<sub>2</sub> emissions to becoming a net source of emissions themselves (USDA Forest Service, 2012).<sup>3</sup> The loss of natural forests is of great concern from a carbon management perspective, as the region’s intact natural forests are generally more carbon dense than its plantation forests. It should be noted, however, that due to intensive investments in silviculture,

## Southeast Georgia Study Area

The field tour in southeast Georgia was a unique opportunity to explore a location of significant interest to the wood pellet sector. This sub-region located on the coastal plain has over 7 million acres of forest, 89% of which is privately owned. The majority (61%) is comprised of trees 25 years old or younger, with fast growing pine species comprising 57% of the total volume. Currently, more trees are being grown annually than harvested, with pines dominating removals. From 1995—2009 just over half of removals in the workshop study area were pulpwood and 36% was sawtimber. There are over 110 wood-using industrial facilities in the workshop study area, many of which are certified, sourcing certified and non-certified fiber in their supply chains, and documenting chain-of-custody with Georgia's load tracking system.

In the region, there are approximately 125,000 acres of non-industrial private forest (NIPF) land enrolled in the Forest Stewardship Program. There are over 2.2 million acres of land certified by SFI in Georgia, much of which is likely located in southeast Georgia. In addition the American Tree Farm System has 790,000 acres of NIPF land enrolled in 26 counties in southeast Georgia. The reach of SFI is extended through Fiber Sourcing, a third-party verified program in which wood-using facilities implement a variety of activities including logger education and training programs. There are over 650 registered Master Loggers within 75 miles of Waycross, Georgia, where the Georgia Biomass export pellet plant is located. There is also one landowner in this area certified by the Forest Stewardship Council (FSC) with over 25,000 acres certified. Some wood-using facilities also use FSC Controlled Wood.

annual accumulations of carbon in plantation systems are typically greater than in natural forests.

The USDA Forest Service predicts that the region could lose from 11 to 23 million acres of forest by 2060, with the greatest loss occurring in the Piedmont region when forest products markets are weak and development pressures strong. To the industry, bioenergy demand (including pellet exports) represents the most significant new market for forest products in the region (Wear & Greis, 2013). New markets for low-grade roundwood create new opportunities for landowners and foresters seeking to improve forest stands. This view was confirmed during the field tour; the industrial landowners participating in the dialogue noted that pellet markets allow them to generate revenue from thinning pine plantations.

Across the South, forest industry-owned timberland is relatively small in comparison to land owned by

non-industrial private forest (NIPF) landowners, who control two-thirds of forests in the region. These NIPF lands also grow a significant portion of the region's forest products for the forest economy and provide valuable wildlife habitat. More than 60% of the region's NIPF lands are 100 acres or more in size, meaning that a majority of NIPF lands are capable of generating a biomass supply. Yet, workshop participants were quick to note that only 3% of NIPF landowners in the region have a written forest management plan, and only 13% have received forest management advice (Wear & Greis, 2013).<sup>4</sup> Likewise, many of the landowners consider income generated through harvesting as only a secondary ownership objective, with many landowners providing valuable wildlife habitat (Butler, 2008). This diverse population has equally diverse management objectives for their forest land, and there is a relatively low level of interest in enrolling in programs like forest certification.

<sup>3</sup> Emissions associated with wildfires and tree mortality in the western US and forest loss in the east are cited as reasons for this projected trend. Note that this forecasted future is based on national USDA Resource Planning Act (RPA) assessment projections from 2010. Since the RPA assessment, USDA has noted that the downturn in US housing markets likely means additional carbon storage in forests associated with reduced removals.

<sup>4</sup> It should be noted that NIPF owners with larger acreages are much more likely than smaller acreage owners to have received management advice and/or have a written management plan.

# Themes Emerging from the Dialogue

## 1. Key Theme—Sustainability is more than a calculation of growth-to-drain ratio at a fixed point in time.

Workshop participants recognized that the South has garnered attention from pellet buyers because:

- Southern forests are very productive.
- At the regional level, growth exceeds removals.
- The location is advantageous from a logistics perspective (e.g. port access).
- Changes in the region's pulp and paper sector appear to be creating opportunities to utilize relatively inexpensive low-grade roundwood, with would-be pellet producers seeking out areas where logging capacity and landowner relationships now lack local markets.

While participants generally concluded these points are important factors for why the market is locating in the region, discussion centered on whether sustainability should be measured by growth-to-drain ratios or should include other measures. There are new opportunities for additional wood-using industries in some places, while in others; demand for low-grade pulpwood continues to be strong, even without demand from energy markets. In these places, the growth-to-drain ratio may already be even or declining. Still, participants generally recognized that there are places on



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Growth rings show the region's productive capacity.

the landscape capable of accommodating new wood pellet operations, at least from a growth-to-drain perspective.

Others emphasized that while growth-to-drain ratios as measured by forest inventory statistics are a convenient way to understand what is happening at a fixed point in time, this approach offers an incomplete view of sustainability over time.<sup>5</sup> There was a sense that more nuanced sustainability concepts must be brought into the conversation.

Participants discussed how biodiversity conservation, water resource protection, and other tenets, of sustainable forest management are deeply-held values among a diversity of interests in the US South, as well as among international stakeholders. Local plans for expanded manufacturing capacity must consider the effects of protecting these values as they are assessing the sustainable level of wood supply within their expected procurement areas. As a way of doing so, some advocated for risk-based and spatially explicit assessments of pellet mill supply chain sustainability, evaluating:

- Standing inventory excluding areas of high biodiversity value (i.e. areas with known occurrences of rare, threatened, or endangered species)
- Current volumes and end-uses
  - Certified volumes
  - Non-certified volumes that could be mixed with certified volumes through SFI Fiber Sourcing and FSC Controlled Wood
- Landowner likelihood of harvesting
- Assumptions about future land-use change
- Projections for sawtimber and pulpwood markets
- Projected changes in forest and wood product carbon stocks

## 2. Key Theme—There is a lack of clear understanding of how pellet demand may affect forest management. This uncertainty frustrates all stakeholders and raises questions about the sustainability of the pellet export sector.

A considerable amount of discussion speculated on how pellet demand might influence forest management. Landowners and foresters pointed to new opportunities to utilize material from pre-commercial thinning and harvest residues that could enhance silvicultural options.

<sup>5</sup> The cyclical nature of timber and pulp markets has caused growth-to-drain ratios to briefly drop below a 1:1 ratio for a few short times in the past, but overall regional carbon stocks have strongly increased over the past 50 years. Still, USDA Forest Service projections (Wear & Greis, 2013) suggest future loss of regional forest carbon associated with urbanization.



Loblolly Pine plantation thinning visited on the field study tour.

Representatives from existing wood using industries expressed that some competition may not be a bad thing for forest sustainability, but that the apparent scale and rapid pace of growth in pellet demand is of concern.

Some speculated that a high level of demand would see higher volumes of material removed during biomass harvests, necessitating biomass harvesting best management practices (BMPs) as a precautionary safeguard. While still others noted that the pellet market, given its reliance on relatively low value fiber, is having little impact on forest management, particularly the integrated harvesting operation that is commonplace in this region. Conversion of natural forests to plantation forests is of major concern for some and another instance where the relationship to bioenergy demand is unclear.

Empirical evidence suggests that landowners do respond to market signals. Historical examples of this include a spike in tree plantings in the region occurring as sawtimber prices increased, and the strong association that exists between forest product markets and tree age class. These historical data and relationships have been used to model future conditions. The range of futures presented at the workshop suggests significant uncertainty in how demand from pellet markets might actually affect existing market structures and forest management decisions. Some relayed anecdotes of direct competition, or fear of competition, between pellets and traditional markets, while others saw a more complementary relationship in the future.

A recently completed multi-year research effort led by the USDA Forest Service known as the Southern Forest Futures

Project found that regional prices for pulpwood roundwood could be affected by energy demand in the future, but the study found significant uncertainty on when and to what extent. While fraught with uncertainty, long-range regional projections do not show changes in markets until aggregate demand increases to a certain threshold volume. Forecasts completed in association with the Southern Forest Futures Project suggest that prices would likely rise when the combined pulpwood grade biomass demand for domestic consumption and exports grows to utilize 45–54 million green tonnes (23–27 million tonnes of pellet equivalent). Such price increases would likely lead to market restructuring, and displacement of some users (Wear & Greis, 2013). Many agreed there likely would be observable changes in forest management and market structure well before some threshold of aggregate demand were to be reached.

In addition to a volume of demand (45–54 million green tonnes) that could shift market structures, the Southern Forest Futures Project also speculates that this level of demand may be realized around 2030. In 2013, the US will export approximately 5.4 million tonnes of biomass (2.7 million tonnes of pellets) of biomass. Information shared at the workshop forecasts exports from the region to grow to 5.6 million tons of wood pellet by 2020. Other analysis suggests more rapid growth, since another 5.4 million tonnes of biomass (2.7 million tonnes of pellets) of capacity is projected to come online over the next two years (Argus Group, 2013). Still, reaching 45–54 million green tonnes per year would require significant acceleration of growth in both US domestic consumption and exports beyond current levels.

### **3. Key Theme—If the export market for pellets is to expand, European sustainability criteria need to be translated to the North American context for successful deployment.**

Participants suggested that the process for defining effective, measurable, and outcome-based sustainability criteria include robust dialogue between the US and Europe. An associated challenge would be reconciling preferences for third-party verification of sustainability practices with the ownership patterns and culture of the South.

It is clear that requiring a high percentage of SFM certified fiber in wood pellet exports will be a challenge, as only 17% of forested lands in the South are certified. There was a general sense among workshop participants that in addition to forest management and chain-of-custody certifications there are other potentially applicable pathways to meeting sustainability requirements, possibly utilizing a risk-based approach. Requirements for forest

management certification were generally viewed as unrealistic given the lack of certified land and that biomass is a low-value forest product relative to other products removed. Still, some felt that options exist to increase the share of certified lands in the region and that energy markets have a role in doing so. During the workshop an NIPF landowner may have best summed up the issue when he quipped, “show me the money,” suggesting that he would participate in a given market or sustainability program if presented with a clear financial motive.

Some suggested that the process of reconciling European expectations with on-the-ground realities in the South presents opportunities for innovations. Ideas included:

- Expanded use of group certification via forest manager certification for both FSC and ATFS. However, with only a few foresters in the workshop study area presently offering this service, some saw a need for supply chain investment by pellet mills and/or pellet buyers.
- Augmenting the outreach, education, and training aspects of SFI’s Fiber Sourcing program to include additional provisions if the procurement area is found to have a measured risk of not meeting European sustainability criteria.
- Devising statistically valid third-party verification, inspection, or monitoring protocols to verify compliance with European market standards at a regional- or supply area-level in a similar manner to how voluntary BMP compliance is monitored by states.
- Expanded utilization of FSC’s Controlled Wood program in the region, with augmentation as necessary to address additional sustainability measures required by Europe.
- Expanded use of biomass harvesting guidelines such as South Carolina’s Biomass BMPs.
- Leveraging state administrative capacity to deploy private funding from pellet buyers through programs like the Forest Stewardship Program for targeted expansion of forest stewardship plans in the procurement areas of pellet mills.

Among these suggestions, the idea of a risk-based approach, e.g. regional or supply chain level risk assessments came up more than once from both European regulators and buyers. This concept was discussed in association with the UK’s Central Point of Expertise on Timber Procurement (CPET) and again with the Sustainable Biomass Partnership (SBP — formerly the Industrial Wood Pellet Buyers), a coalition of seven European power companies. The SBP is aiming to be



A timber harvest load ticket used to track harvested wood in Georgia’s fiber market.

Brian Kötter

a mechanism utilities can use to demonstrate compliance with the regulatory requirement of different legal jurisdictions in one framework.

CPET provides practical advice on implementation of the UK’s biomass sustainability criteria, CPET is actively seeking to understand US systems of wood procurement. For pellets in the South, CPET is largely about the “Category B” evidence route for demonstrating sustainable fiber procurement. Category A is a straightforward default to sourcing with SFM certification, with wood needing to include at least 70% certified (i.e. “sustainable”) to 30% non-certified content (but “legal”) in order to demonstrate that supplies are both “legal and sustainable.” While not requiring certification, Category B appears to be quite rigorous in calling for “equivalent evidence” as Category A, (i.e. at least 70% determined by CPET as being from “sustainable” origins, with 100% “legal”).

CPET is actively seeking to understand what may qualify as evidence for compliance with Category B for wood pellets originating in the Southeast US, and has indicated that such an assessment may include state if not county level study. At the workshop, several US programs were discussed as potential means to comply with aspects of Category B, but it is clear that additional consideration of these approaches is necessary.

Some participants wondered whether state-level periodic monitoring of BMP compliance should be explored in relation to CPET’s expectations for third-party verification, and if need be, might state monitoring programs change to meet this requirement. Other participants wondered if third-party verification is really necessary (and feasible) at the level of the pellet mill supply chain. The concept of supplier risk-based assessments for each principle and

criteria listed in Category B was also discussed, with workshop participants wondering how such a risk-assessment might compare with the type of risk assessment described above in Key Theme 1 (see page 6).

Other things being evaluated by CPET include a mix of:

- Forest management plans (participation in the Forest Stewardship Program, for instance)
- Implementation of BMPs
- Contractor training, and specifically trainings sponsored by facilities using SFI Fiber Sourcing
- Supply area risk assessments, looking at a range of issues, including controls for minimizing harm to ecosystems, maintaining forest productivity, and ensuring ecosystem health and vitality
- FSC Controlled Wood and PEFC Avoidance of Controversial Sources

#### **4. Key Theme—There is a need to reconcile the intent behind the European Commission’s prohibition of biomass from wetlands with the legally permissible logging of certain wetlands in the US.**

Proposed criteria from the European Commission suggest a prohibition of biomass sourced from wetlands. This is assumed to be due to the ecological value of wetlands in

providing biodiversity, water quality, and carbon storage. A few issues surfacing in discussions illustrate a need for clarifying the intent of this criterion:

- There appears to be no universally accepted definition of wetlands (in part because there are many types), making a prohibition problematic in its implementation, especially given that some wetland designations are somewhat subjective.
- It is legal to practice silviculture in wetlands in the US, meaning that logging of forested wetlands is permitted as long as wetland hydrology and existing laws requiring best management practices (BMPs) for maintaining water quality and protecting endangered species are abided by.
- Some wetlands that were previously drained and converted to agriculture and later pine plantations contribute important volumes of fiber. Yet, draining of additional lands is prohibited under the “swamp buster” provisions of the Clean Water Act. The regeneration of Loblolly pine in Southern forests requires no major drainage activities.

The South is the most biodiverse region of the US, and much of this diversity occurs in bottomland hardwood forested wetlands, most of which are privately owned. Of key conservation concern are relict older age bottomland systems that are quite rare. While pine plantations typically have lower biodiversity value as compared to bottomland

### **CPET Category B Requirements**

1. Third-party verification of items 2, 3 and 4 below
2. Demonstrate Chain-of-Custody/traceability in the supply chain to the forest source for 70% of material, where 70% must be legal and sustainable, with balance being legal)
3. Demonstrate the harvested fiber complies with applicable laws
4. Demonstrate the site-specific sustainability of the source of 70% of harvested fiber, including third-party verification of this sustainability
  - a. A locally applicable definition of sustainability is required
  - b. Specific requirements for how the definition was developed (multi-stakeholder process etc.)
  - c. Overall forest management principles and criteria to:
    - i. Minimize harm to ecosystems
    - ii. Maintain forest productivity
    - iii. Ensure forest ecosystem health and vitality
    - iv. Maintain biodiversity
    - v. Include social criteria

systems, environmental interests have expressed concern that pellet demand would not be constrained to plantation forests and would spill over into wetland forests. Others felt that risks to areas of high conservation value are adequately mitigated through existing law—such as the Federal Endangered Species Act and Federal Clean Water Act—and procurement practices such as using SFI’s Forests of Exceptional Conservation Value and/or FSC’s High Conservation Value Forests and CPET’s procurement rules. Under these programs, ecological communities and species at risk of becoming endangered—rather than just endangered species—must be located and associated lands specifically managed for these communities and species.

**5. Key Theme—There is emerging agreement around the need to account for biogenic and combustion carbon emissions and the principles to do so, but expectations vary from stakeholder to stakeholder.**

The last three years have seen increased debate and scientific research into the climate effects of forest bioenergy. There appears to be increasing agreement, at least among those participating in this workshop, that forest bioenergy has definite greenhouse gas mitigation benefits as compared to fossil fuel alternatives, but in the workshop there was a disagreement over whether there is a time lag (or carbon debt) before those benefits are realized. Presenters at the workshop synthesized findings from the majority of biogenic carbon accounting studies completed over the last two decades. The overwhelming majority of these studies find

that compared to fossil fuel energy systems, forest bioenergy has greenhouse gas mitigation benefits in the long run.

The majority of studies find these benefits beginning to accrue 30–50 years after the start of the system, but payback periods in these studies vary from virtually immediate (within two years), to quite long into the future, with the timing depending heavily on assumptions, methods, and regional differences, but also on several components of forest bioenergy systems (e.g. feedstock type and origin, energy technology, fossil fuel replaced, etc.).

With the carbon debt question occupying significant attention in recent years, one perspective underscored during the workshop is that while the greenhouse gas profile of forest bioenergy is extremely important, it is not the sole metric by which bioenergy should be judged as sustainable or not. Moreover, some cautioned that there is a need to differentiate between sustainability criteria for carbon management and sustainability criteria for sustainable forest management, suggesting that these do not always necessarily go hand-in-hand. There is a need to differentiate between carbon accounting and other areas of sustainability (e.g. wetlands, biodiversity) in order to identify potential tradeoffs between carbon and other components of sustainability.

Beyond these basic points of understanding, the dialogue highlighted areas where stakeholders diverge and converge in their views.



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A non-industrial private forest parcel in Wayne County, Georgia.

## Convergent ideas and principles:

- Policy should not be based on modeling alone. Stakeholder vetting is important, as is scientific debate.
- Policy options for controlling greenhouse gas emissions vary (e.g. greenhouse gas calculators and emissions default units, system-wide performance standards, regulation of acceptable and non-acceptable feedstocks, ignore the issue, incentivize certain energy systems to be developed) and the selection of policy options will incentivize what sort of energy system is ultimately deployed.
- Best practices or performance standards for bioenergy (forest management practices, energy technologies, forest types, etc.) could be developed to emphasize bioenergy systems with greater potential for greenhouse gas mitigation benefits.
  - Sustainable forest management is fundamental.
  - In the South there may be opportunities to increase planting density of plantations and use pre-commercial thinnings for biomass.
  - Using marginal and unused land for feedstock production generally creates immediate net carbon benefits.
  - Utilizing mill residuals and logging residues accrue carbon/climate benefits quickly.
- Concerning the math of carbon accounting, areas of agreement include:
  - Accounting is incomplete if emissions and re-sequestration within the forest sector are ignored, and if net changes in energy and material stocks are not properly examined. Policy needs to reflect this.
  - The construction of baseline scenarios should be based on real-world data on actual forest management patterns and economics, reference fossil fuel energy systems, as well as underlying transport systems for both bioenergy and reference fossil-based energy scenarios. Getting the baseline right is key to determining the time lag until net greenhouse gas emission benefits are achieved.
  - There is emerging consensus within the scientific community that determining the overall climate mitigation potential of bioenergy requires going beyond mere carbon accounting, i.e. incorporating assessments of the albedo effect and climate dynamics (e.g. pulse emission responses).

## Divergent ideas and principles:

- There is disagreement over whether any delay in the timing of climate mitigation benefits (even short-term delays) should be considered acceptable, even in areas where overall forest carbon stocks are positive and increasing, and can be forecasted to do so into the future.
- There is lack of agreement around the acceptable length of payback periods, with some objecting to the concept of a carbon debt because they believe it does not accurately credit landowners with past and contemporaneous actions taken to regrow forest stocks.
- While participants agreed that getting baseline and reference scenarios accurately defined is of central importance, opinions varied with regards to baseline forest management futures (e.g. wood is harvested, used for pulp, and replanted, or wood is harvested for pulp and land is converted to other uses, or wood remains growing for several more years, etc.).
- There is disagreement over how to evaluate the economic effects of bioenergy demand at a regional scale and the resultant greenhouse gas emissions effects from the forest energy sector. Some studies have largely ignored future market effects on planting rates and forest management activity with increased energy demand. Others attempting to integrate the economics of bioenergy demand find that bioenergy demand in the South might contribute to a landscape-level management response (more acres planted, acres managed more intensively, less acres converted to other uses) that offers greenhouse gas mitigation benefits.
- Perspectives and definitions matter, as one's residue may be another's roundwood.
- Stakeholders have varying perspectives regarding the role forest certification systems play, or could play, in incentivizing climate-friendly bioenergy.
- Some felt that SFM certification standards should include greenhouse gases in a meaningful way. Others felt that this should be held off until a proper framework for accounting is fully agreed upon.

## Conclusion

The Savannah workshop was a unique opportunity to bring together a broad spectrum of stakeholders to evaluate sustainability issues—particularly biomass sourcing options—at a critical moment in the development of the global wood pellet trade.

A key objective was to increase the collective understanding of sustainable procurement options already in use in the South and how these systems match up to European demand. Connections among participants were strengthened for future cooperation in hopes of establishing meaningful sustainability criteria. These connections are key to informing ongoing processes such as the deliberations of the Sustainable Biomass Partnership and governmental bodies throughout Europe and North America.

Key points of discussion highlighted the need to:

- Expand our understanding of sustainability concepts beyond simple growth-to-drain calculations
- Clarify understanding of how pellet demand may affect forests and forest products markets in the future

- Negotiate scientifically robust and effective European sustainability criteria (third-party verification, risk assessment and mitigation, etc.) and develop procedures for satisfying these criteria within the US
- Continue the dialogue around biogenic and combustion emissions with a focus on (1) enhancing scientific understanding of the complexities involved, and (2) analyzing intended and unintended consequences of policy and regulatory options

Substantial common ground was established among the diversity of organizations and individuals participating. There is an active interest from all parties in follow-on dialogue that would allow remaining differences to be addressed and workable solutions found. Some of the participants who were most doubtful about the feasibility of addressing European concerns over sustainable sourcing prior to the workshop, from both Europe and the US, were subsequently among those expressing the strongest reassurance that practical solutions can be found. Several in attendance recommended follow on discussions to resolve remaining issues, including a repeat of such an event in a year's time. Stakeholders identified a common purpose in identifying meaningful criteria so that buyers have reliable assurance that standards are being met, sellers have viable markets, and the public gets renewable energy without harming the environment.



Brian Kötter

Workshop participants from the US and Europe learning how fiber moves to market in the Coastal Plain of Georgia.

## Testimonials from Participants in the Savannah Workshop

*“Sustainability is a prerequisite for the use and further growth of solid woody biomass in energy applications. This event was a unique opportunity for energy, forestry, and conservation interests in the United States and Europe to examine the opportunities and challenges for the energy industry to contribute to the sustainability of a renewable resource in the southeast US.”*

—Volker Türk, Manager Corporate Responsibility, E.ON Climate & Renewables

*“Certainly I got updated on evolving policy in the EU. But even more importantly, I met key government and industry personnel from both sides of the Atlantic, and started what have already become constructive relationships.”*

—Ben Larson, Manager Agriculture Program, National Wildlife Federation

*“This event has made an outstanding contribution to the much needed dialogue among stakeholders engaged in and concerned about trans-Atlantic trade in wood pellets for energy. It was a necessary follow-on from a dialogue between North Americans and Europeans initiated in Quebec in 2012. The indoor sessions provided ample opportunity to dive deeply into controversial and technical details regarding the forest sector in the southern US and to collectively gain new levels of understanding about timber supply, private and industrial landowner approaches to sustainable forest management, and ways in which land use and conservation and forest products markets might be impacted by European demand for wood pellets. The field tour gave European colleagues a first-hand look at management of privately-owned southern pine plantations and an opportunity to speak directly with industrial foresters and an award winning, well-respected southeast Georgia farmer and forest landowner. The field tour translated abstract concepts discussed indoors into something first-hand and real—we saw sustainably managed forests that have been owned and managed for multiple uses over several generations by honest and hard-working people who have to make a living off the land and who care deeply about conservation of the land and the region’s forests. The Quebec and Savannah events must be continued as there are many controversial issues that need to be resolved through intense debate and discussion before we find ‘common ground’ on what constitutes sustainable forest management for bioenergy and fair and equitable governance systems to ensure conservation of our forests and mitigation of climate change.”*

—C. Tat Smith, University of Toronto and IEA Bioenergy Task 43

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## About the Pinchot Institute for Conservation

The mission of the Pinchot Institute is to strengthen forest conservation thought, policy and action by developing innovative, practical, and broadly supported solutions to conservation challenges and opportunities. Pinchot Institute accomplishes this through nonpartisan research, education and technical assistance on key issues influencing the future of conservation and sustainable natural resource management.

## About IEA Bioenergy

IEA Bioenergy is an organisation set up in 1978 by the International Energy Agency (IEA) with the aim of improving cooperation and information exchange between countries that have national programmes in bioenergy research, development and deployment.



Brian Kritler

Savannah workshop participants.



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