The Transatlantic Trade in Wood for Energy:
A Dialogue on Sustainability Standards and Greenhouse Gas Emissions

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Acknowledgments

Task 40
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Workshop Funders
IEA Bioenergy Executive Committee, Sustainable Forestry Initiative, Programme for the Endorsement of Forestry Certification, Weyerhaeuser, MeadWestvaco Foundation, E.ON, Plum Creek, Georgia Forestry Commission.

Workshop planning committee
Webinar Agenda

1. A global look at these issues. (Tat)

2. 10 minute Q&A session #1

3. Overview of the Savannah workshop (Brian)

4. 10 minute Q&A #2

CFE Credits are available for SAF registered foresters.
Outline

• Major driver of demand for bioenergy – need for reducing net CO\textsubscript{2} emissions
• Global wood pellet trade
• Relative importance of traditional forest products vs bioenergy feedstocks
• Dominance of forest products sector for bioenergy supply
• Stress the long-term net GHG benefits associated with bioenergy systems
• Governance of sustainable forest management (SFM) and bioenergy trade
• Challenges to increase scale of certified trade flows

Going forward – continued dialogue:

• Impacts of bioenergy demand on forests & forest products markets
• GHG benefits & challenges of bioenergy
• ‘Governance’ of sustainable bioenergy supply chains
  • Sustainability criteria
  • Institutional alternatives – government, bioenergy sector, certification sector
  • Procedures for verification
We need a global 50% CO₂ cut by 2050

A wide range of technologies will be necessary to reduce energy-related CO₂ emissions substantially

**Major drivers**
- Wood pellet trade
- Forest products vs bioenergy
- Long-term GHG benefits
- Governance
- Going forward

**Baseline emissions** 57 Gt

**BLUE Map emissions** 14 Gt

- CCS 19%
- Renewables 17%
- Nuclear 6%
- Power generation efficiency and fuel switching 5%
- End-use fuel switching 15%
- End-use fuel and electricity efficiency 38%

Source: ETP 2010

Source: OECD/IEA 2010
Global Ag., Forestry & Bioenergy Perspectives

Traditional agricultural and forest products markets dominate over bioenergy

Current bioenergy
- ‘Modern’ bioenergy: 10-15 EJ/year
- Total global bioenergy: 50 EJ/year

Current production of forestry and agricultural biomass
- Industrial roundwood: around 15 EJ/year
- Major agricultural crops: about 60 EJ/year.

Comparison of NA-EU wood pellet trade vs. global wood pulp exports
- World exports of wood pulp (2011): 53.4 M t/year (~1 EJ)
- NA wood pellet exports to Europe (2012): about 3.2 M t/year (0.06 EJ)

Concerns arise from potential global demand for bioenergy

Deployment level of IPCC scenarios by 2050
- 440-600 ppm CO$_2$ eq target: 80-150 EJ/year
- <440 ppm CO$_2$ eq target: 118-190 EJ/year
Global wood pellet trade flows > 10 ktonnes

Traditional Forest Products Markets Dominate
Bioenergy remains a marginal, residual (mill & harvest) assortment

STAND:
Round wood 250 m³
Forest residues 100 m³
At least one third of the logging residues and stumps will be left in the forest as a fertiliser

ROUND WOOD WITH BARK
250 m³

FOREST RESIDUES

STUMPS
Potential 60 - 80 m³
For energy 50 - 60 m³
20-25 odt

BUNDLING OF FOREST RESIDUES

Forest chips 110 - 120 m³
47-51 odt

Bark, sawdust and other wood residues

SAWMILL/PULP MILL 190 - 210 m³

TOTAL WOOD FUELS
150-180 m³ = 300 - 360 MWh
Heat production = 170 - 200 MWh
Electricity production = 85 - 100 MWh

105 odt
42 odt

E.Alakangas

Major drivers
Wood pellet trade
Forest products vs bioenergy
Long-term GHG benefits
Governance
Going forward
Sources of Forest Bioenergy Supply
Swedish forest products sector

Manufacturing residues dominate national supply

- Residues: 4.4 TWh
- Chipwood: 1 TWh
- By-products: 5 TWh
- Thinning: 0.7 TWh
- Recycled wood: < 5 TWh
- Imports: ~ 3 TWh
- Black liquor, Pine oil: > 35 TWh
- Forest sector: > 50 TWh

Source: Björheden, 2004
Research to date supports the IPCC statement:

« In the long term, sustainable forest management strategies aimed at maintaining or increasing forest carbon stocks, while producing a sustained yield of timber, fibre, or energy from the forest, will generate the largest sustained mitigation benefit. »

IPCC 2007 ch 9: Forestry, AR4, Group III
Bird et al. -- IEA Bioenergy:ExCo:2011:03
Figure 2 illustrates the timing of GHG savings in a case where there is a GHG cost, using the example of a stand that is thinned twice before final harvest, and where thinning and harvest residues decay slowly on-site in the reference case. Figure 2a shows the carbon stocks ((sum of carbon in trees, soil and litter) at stand level in the reference and bioenergy cases.  Figure 2b shows the GHG savings from an individual stand as the biomass removed from the forest is used for energy products, and Figure 2c shows the GHG savings summed across a landscape comprising multiple stands at different stages in the rotation cycle, assuming that all stands follow the red curve from Figure 2a.

Note significance of:
- Long-term net benefits of bioenergy
- Forest ecosystem dynamics
- Forest management
- Feedstock source (residues, unused AAC)
- Fossil fuel reference system energy density
- Time

Cowie et al. -- IEA Bioenergy: ExCo:2013:04

Major drivers
Wood pellet trade
Forest products vs bioenergy
Long-term GHG benefits
Governance
Going forward

Figure 2a Stand level carbon stock

Figure 2b Stand level GHG savings

Figure 2c Landscape scale GHG savings

Long-term GHG benefits

Short-term delay in timing of mitigation
Governance takes several forms:
- Strictly enforced regulations
- International sustainability standards
- State and provincial guidelines and BMPs
- Voluntary market-based certification systems

Consider relative benefits of:
- Ring-fencing no-go areas
- Developing SFM systems for managed lands

Martin Holmer, 2001
Growth in Certified Forest Area (million ha) to 2010

Only about 10% of global forests are under certified sustainable management

The Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC), the two largest forest certification bodies worldwide with slightly different approaches to management and certification, certify socially and environmentally responsible forestry. An impressive annual 20% growth rate of labeled forests indicates that both producers and consumers are actively influencing timber production. Nevertheless, in 2010 still only about 10% of the total forest extent was managed under FSC and PEFC practices.

http://www.grid.unep.ch/
**Going forward – continued dialogue & research is critical:**

- Impacts of bioenergy demand on forests & forest products markets
- GHG benefits of bioenergy (IEA Bioenergy event 19-20 May 2014, Copenhagen) – LUC and timing of mitigation benefits
- ‘Governance’ of sustainable bioenergy supply chains
  - Sustainability criteria
  - Institutional alternatives – government, forestry, bioenergy & certification sectors
- Procedures for verification of local & global trade
Q&A session 1
A Need for Increased Dialogue on Sustainability

• Savannah, GA Workshop. A two day event with 60 participants from 9 countries. Diverse interests represented.

• Report and workshop proceedings available at: pinchot.org/pellets
Savannah Meeting Overview

I. Projected European biomass demand and the U.S. supply response

II. Sustainability of the southern forest resource and sustainability issues in the regions’ private forests

III. Need for easily measurable and effective sustainability indicators

IV. Need for parity between emerging sustainability policies from Europe and U.S. sustainability programs and practices

V. A focused debate on the accounting of biogenic and combustion emissions
Why a Meeting in the South?

- Largest wood pellet producer globally.

- Very different context than Canada.
  - 89% of timber is on private land, 2/3 are non-industrial forests.
  - Largely non-regulatory approach to forest management.
  - Only 17% of South is certified vs. nearly 70% of managed forestland in Canada.

- A market driven system. Plantations doubled between 1990 and 2010 (20 – 40 million acres); Maybe increase 7 - 27 million acres in next 50 years. Role of energy markets in this dynamic landscape?
Why a Meeting in the South?

• > 60% of U.S. timber is produced in the South.

• The most biodiverse region in the U.S. and Canada.

• 11 - 23 million acres of forestland is projected to be converted in the South by 2060 (USFS).

• Weak forest product markets = largest conversion, and bioenergy is largest source of new demand (USFS).
Projected European Biomass Demand and the U.S. Supply Response

- EU expected to import at least 20 million metric tons annually by 2020, going out beyond this could increase to 60 million metric tons by 2030.

- There is a lack of clear understanding about how pellet demand may affect forest management.

- Bioenergy is a marginal market until a point (45 – 54 million tons of additional pulpwood demand?) (Wear & Greis, 2013).

- The South could technically support up to a 40% increase in timber production from 2006–2007 levels (Wear & Greis, 2013).

- Future expanding pine plantation acreage is linked to sawtimber and pulpwood markets, and possibly the pellet export market going forward.
Projected European Biomass Demand and the U.S. Supply Response

- In 2013, the U.S. exported approximately 5.4 million green tonnes of biomass (2.7 million tonnes of pellets).
- Information shared at the workshop forecasts exports from the region to grow to 5.6 million tons of wood pellet by 2020.

Georgia Biomass Pellet Mill in Waycross, Georgia.
Sustainability of the Southern Forest Resource

- 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.

- Sustainability is more than G:D.
  - Areas of high biodiversity, current volumes and end uses, certified volumes, non-certified volumes that could be readily mixed, landowner likeliness to harvest, future land use change, etc.
Reconciling Emerging Sustainability Policies from Europe and U.S. Sustainability Programs

• European Criteria
  – GHGs, Biodiversity, wetlands, carbon stocks, CoC, 3rd party verification.

• Ongoing processes:
  – European Commission, member states, Sustainable Biomass Partnership.

• Ideas emerging at the workshop:
  – new methods of verifying implementation of voluntary practices,
  – expanded use of “Controlled and Sustainable Sourcing,” possibly modified,
  – Group certification,
  – Expanded use and verification of Biomass Harvesting Guidelines (BHGs),
  – Leveraging private capital to channel through existing public programs (e.g. the Forest Stewardship Program),
  – Risk-based approach to supply chain assessment (appropriate scale?) .
Debate on the Accounting of Biogenic and Combustion Emissions

• Some clear areas of general agreement and areas where additional research and debate is necessary.

• Agreement that we need to get the math right, but disagreement around how to frame the questions.

• Divergent views on what are acceptable payback periods, with some arguing a nuanced view on carbon neutrality, and others expressing that no payback period is acceptable.

• Opportunities for best practices?
Summary Report and Presentations are available: 
http://www.pinchot.org/pellets

Photos from both days: 
http://www.flickr.com/photos/pinchotinstitute
Going Forward

1. Should we be concerned about potential trade disputes?

2. How do we move forward with imperfect information?

3. What is the best way to pilot test procurement pathways or cross walk standards?

4. How can we broaden the “community of actors” in this dialogue to find practical and meaningful solutions?
Q&A session 2
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