

# Sustainability and Carbon Balance of North American Pellets used for EU Bioenergy Production

**WPAC AGM / Conference**

**18-20 November 2013 | Vancouver Canada**

Gordon Murray, Executive Director  
November 19, 2013



# A substantial risk for the industrial wood pellet sector

**Question 1.** why use pellets to generate power if coal is so much cheaper?

**Answer:** because wood pellets are:

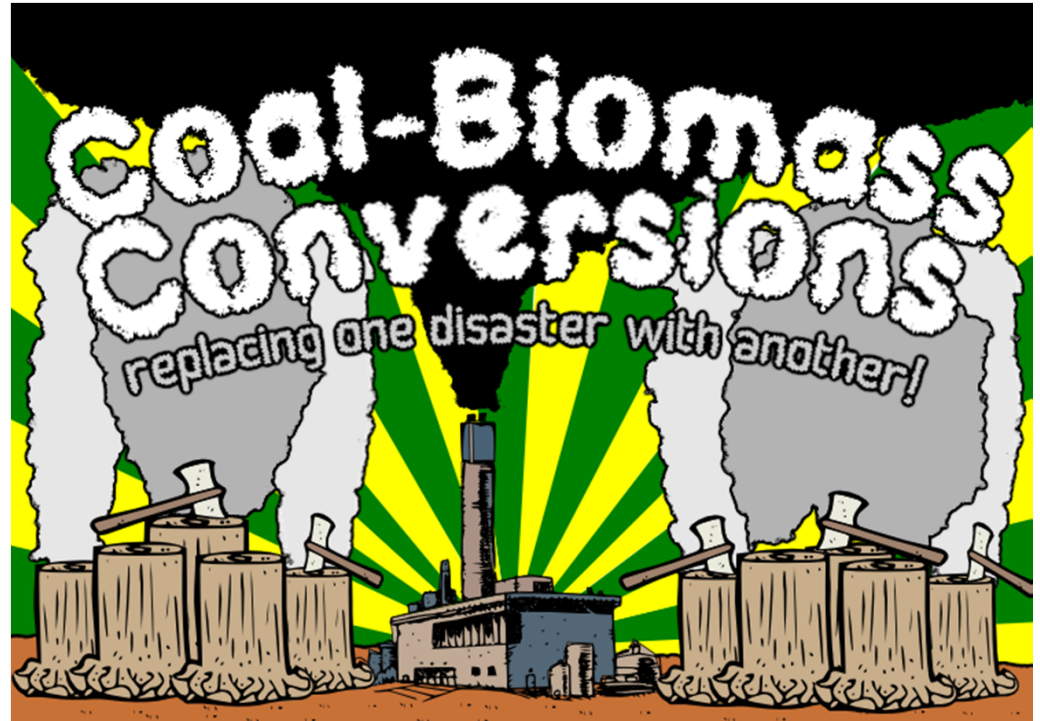
- Renewable energy
- Made sustainably
- Provide significant carbon benefit



**Question 2.** what will happen to our industry if NGOs convince regulators that any or all of the above are untrue?

# Environmental NGOs oppose biomass energy


- Biofuelwatch
- Dogwood Alliance
- Friends of the Earth
- Greenpeace
- Royal Society for the Protection of Birds



They are organized, well-funded, and have access to regulators and politicians, especially in London and Brussels

# Sample NGO reports

Dirtier than coal?  
Why Government plans to subsidise burning trees are bad news for the planet



RSPB friends of the earth GREENPEACE



**Biomass:**  
*The Chain of Destruction*



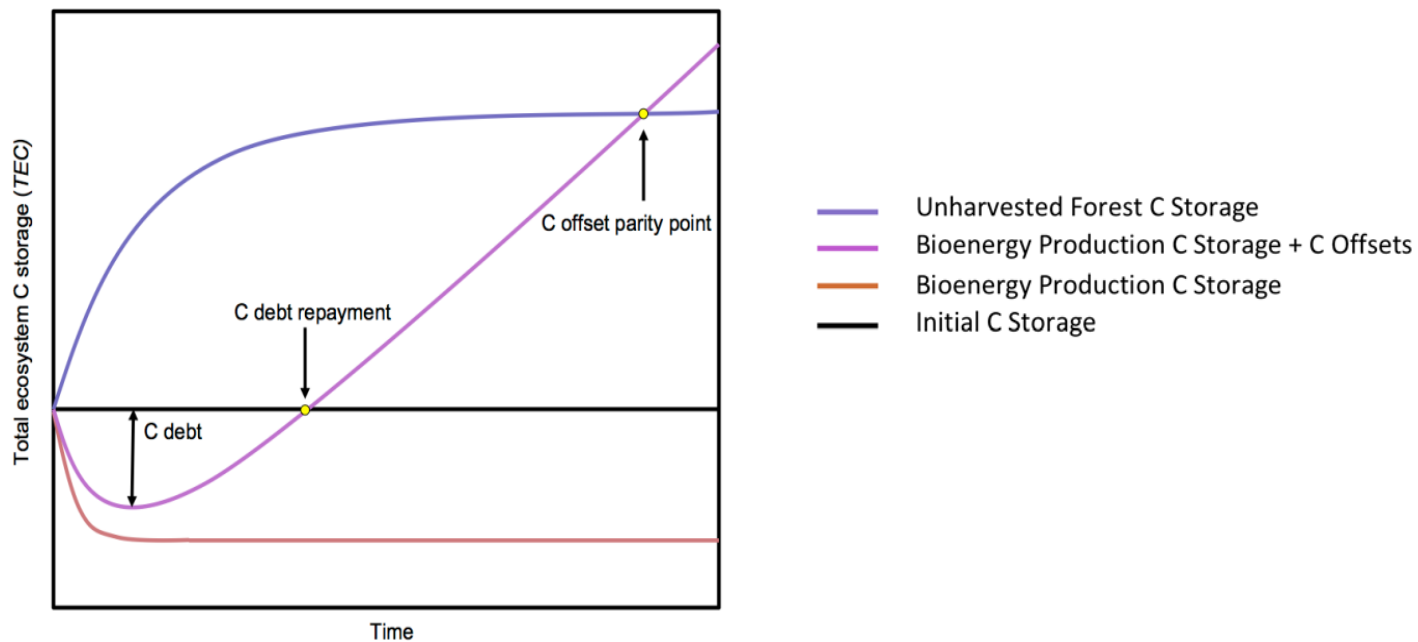
## NGO Claims

- Biomass demand = increased harvesting
- Forests are harvested specifically for biomass
- Biomass harvesting is unregulated and causes environmental damage
- Burning biomass releases more CO<sub>2</sub> than coal
- Biomass leads to a carbon debt



# Concept of carbon debt

**Carbon debt:** the reduction in forest carbon stocks that occurs when wood is harvested, compensated for the emission savings achieved by the replacement of fossil fuel. It is re-paid when the carbon savings of avoided fossil fuel use from using the wood to generate energy plus the regrown carbon stocks in the forest equal the initial debt.



# A study carried out by the industrial wood pellet sector

## *Forest Sustainability and Carbon Balance of EU Importation of North American Forest Biomass for Bioenergy Production*

Study carried out by:



*With the collaboration of:*

- Drax
- GDF SUEZ / Laborelec
- ESSENT NV
- E.ON Climate & Renewables
- Danish Energy Association
- Vattenfall AB

Study published in  
September 2013  
and available on  
[www.aebiom.org](http://www.aebiom.org)

Reviewed by Dr. Martin Junginger, Utrecht University, Copernicus Institute

*This slide supplied by Fanny-Pomme Langue of AEBIOM*

## Study synopsis

- Focus on BC and Southeast US as two largest supply regions
- Objectives: inform stakeholders on biomass sourcing, sustainable forest management practices, forestry commercial realities and modelling results based on realistic data based on actual practices
- Conclusion: when data and assumptions based on actual practices are used in models, pellets achieve significant GHG savings and make meaningful contribution to climate change mitigation

*This slide supplied by Fanny-Pomme Langué of AEBIOM*



## Pellet fibre sources: BC

- Industrial residues (80-85%) from sawmills
- Harvest residues (15-20%): low grade logs and low value materials from harvesting (tops and branches)
- No dedicated harvesting for biomass

*This slide supplied by Fanny-Pomme Langue of AEBIOM*

# Pellet fibre sources: BC

## Logging residues



## Sawmill residues



*This slide supplied by Fanny-Pomme Langue of AEBIOM*

# Pellet fibre sources: Southeast US

Mill waste and residues



Tree tops and branches



Low grade roundwood fiber



Commercial thinnings



# Sustainable forest management

- Wood pellet fuel imported from North America and burnt for energy purposes **comes exclusively from sustainably managed forests**
- **USA:** Federal laws (e.g. Clean Water Act, Clean Air Act, etc.) and State laws and practices (e.g. “Best Management Practices” (BMPs) for silviculture, forest management and forest harvests)
- **BC, Canada:** *BC’s Forest and Range Practices Act (FRPA)* to balance economic and environmental benefits across the landscape. *Allowable Annual Cut (AAC)* for each management unit
- **Independent forest sustainability certification programs:** Framework for an independent evaluation of the sustainability of a forest or a forest products company’s operations, from forest to product (e.g. CSA-SFM, SFI and FSC)

*This slide supplied by Fanny-Pomme Langue of AEBIOM*



# Managed forests are never used for bioenergy alone

Bioenergy products are part of a **multi-products approach**: forest managers do not manage their forest for bioenergy purposes only as it is not economically interesting

The **highest value** product of forests is **timber, which generally represents 70-90% of the value of a forest tract.**

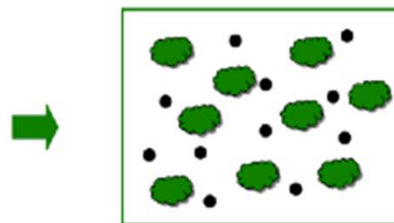
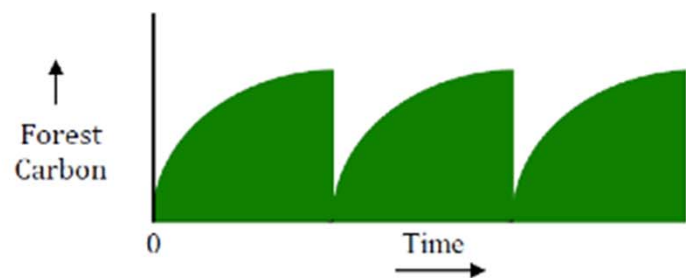
*This slide supplied by Fanny-Pomme Langue of AEBIOM*

# Modeling of carbon balance of biomass used for energy: methodological choices

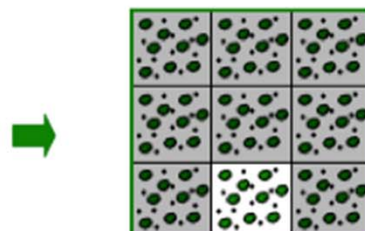
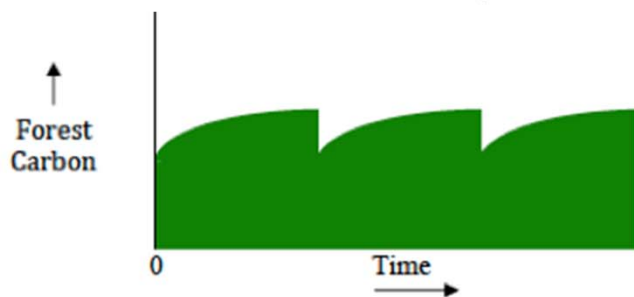
1. **Reference point baseline:** net change from a current reference point. *“Is there more or less carbon at the start of a period than at the end of a period?”* I.e. growth to drain ratio
2. **Anticipated future baseline:** net change from a possible future. Use of counterfactuals. *“What would the carbon balance have been under a different set of circumstances?”*



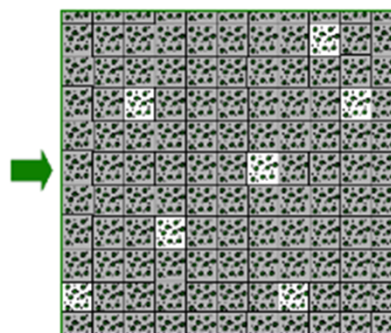
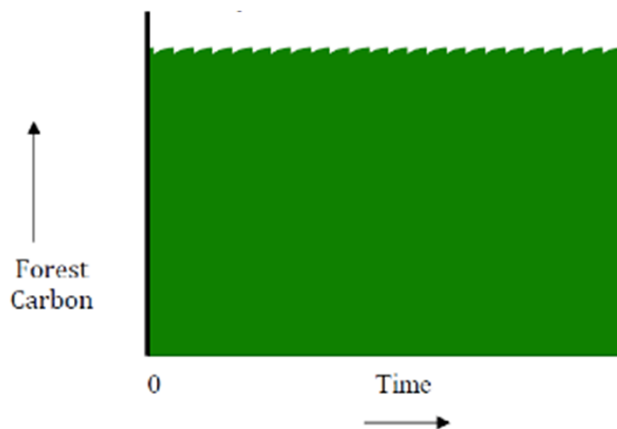
# Spatial considerations



Forest stand level



Multiple stand level



Landscape level

## Other considerations (partial list)

- Start of accounting period – at planting or harvest?
- Growth and decomposition rates
- Type of fossil fuel being replaced
- Energy conversion efficiency
- Choice of counterfactual

*This slide supplied by Fanny-Pomme Langué of AEBIOM*

# Modeling scenario assumptions – biomass source

## Biomass source

- Studies finding a long “Carbon Debt” assume whole slow-growing forests that are harvested solely for bioenergy. This assumption does not reflect current forest management
- In reality, biomass is made of residues, by-products, and low-grade wood fibre which do not result in delays in achieving GHG-savings

*This slide supplied by Fanny-Pomme Langue of AEBIOM*

## Modeling scenario assumptions – counterfactual choice

**Choice of counterfactual: The choice of comparison to “alternative future” has a decisive impact on the modeling results**

- Mainly important for “hypothetical” scenarios where the whole forest is harvested for bioenergy = unrealistic
- Many unrealistic counterfactuals. E.g: Assuming that without bioenergy, the forests would continue to grow and would be untouched = scenario involving harvesting natural forest purely for bioenergy
- **Appropriate counterfactual in BC, Canada:** disposal of residues
- **Appropriate counterfactual in SE USA:** leaving forest residues on the forest floor; need of forest owners to receive economic benefits from their forest

*This slide supplied by Fanny-Pomme Langue of AEBIOM*

# Assumptions chosen

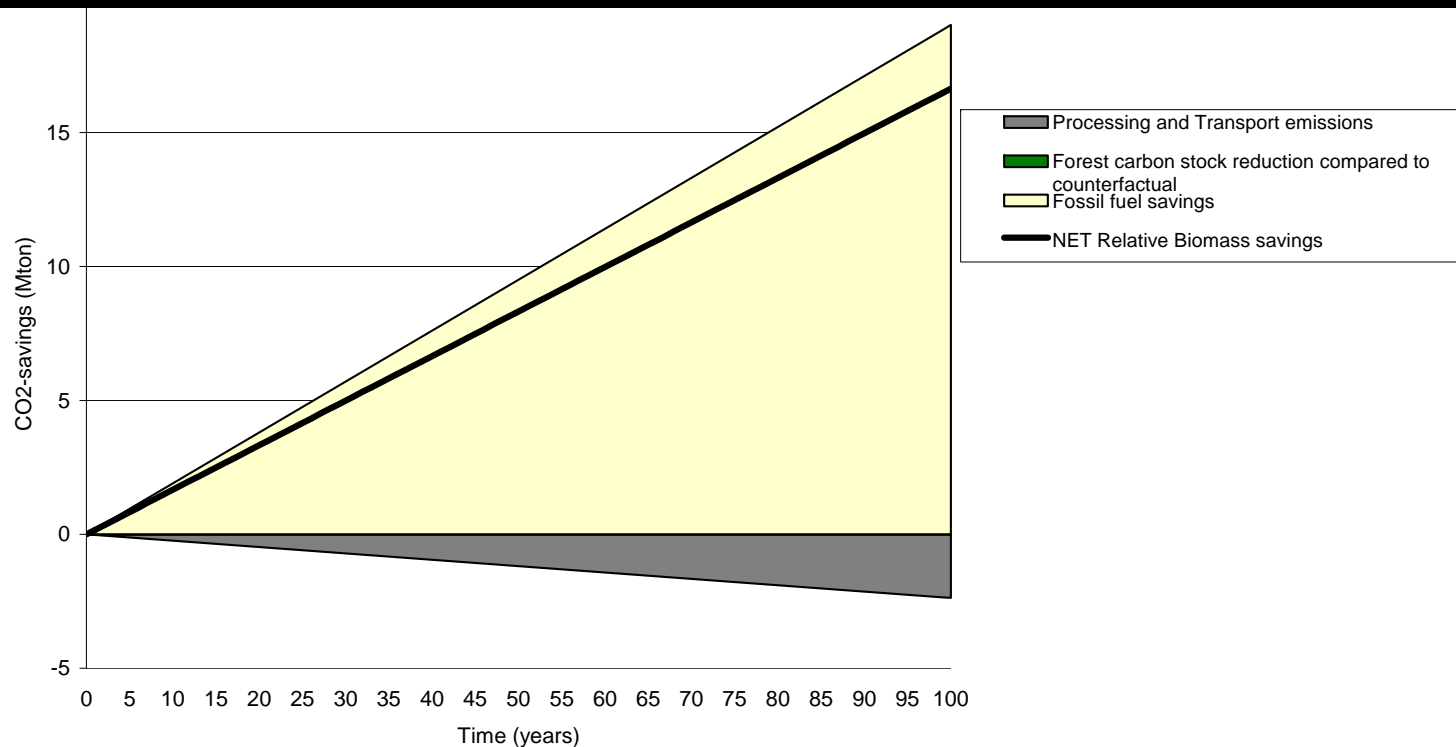
- **Common key assumptions**

<b>Spatial basis for model</b>	Increasing plot level approach based on production and consumption of 100,000 tons wood pellets per year
<b>Region</b>	SE USA or BC Canada
<b>Emissions from processing and transport</b>	Industry data cross-referenced with literature
<b>Wood pellet use</b>	Co-firing in EU coal plant with 40% electrical efficiency

- NB: the study has looked at **absolute and relative savings**

*This slide supplied by Fanny-Pomme Langue of AEBIOM*

# Modeling BC situation

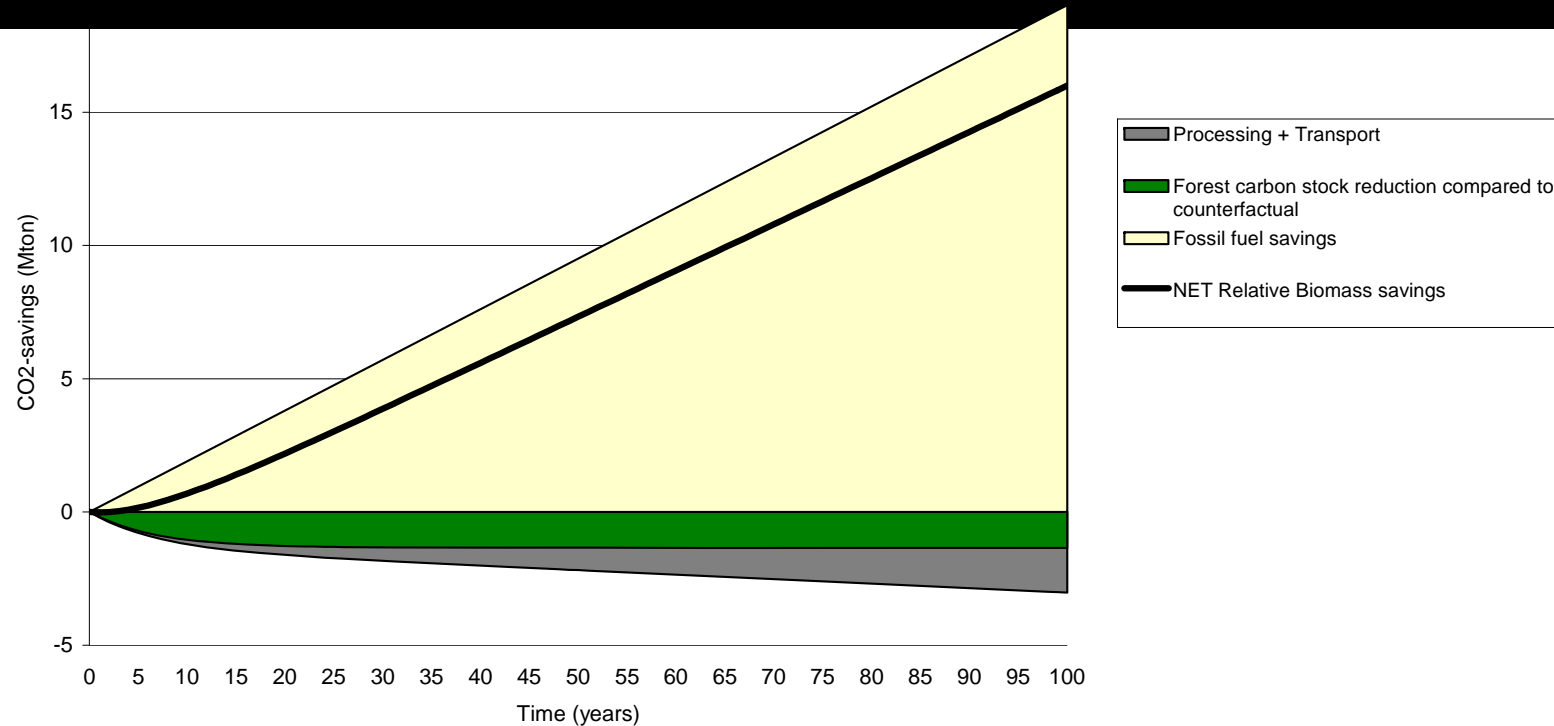


**AFB:** Relative GHG-emission savings are achieved immediately. **There is no carbon debt** since the counterfactual is to burn the residues. **After 20 years, emission savings amount to 3.3 Mtons CO<sub>2</sub>.**

**RPB:** absolute savings identical to relative savings



# Modeling Southeast US situation



**AFB: Net relative savings (compared to the counterfactual of leaving residues in the forest) are achieved from year 3 onward.** Parity point reached after 3 years. After that, emission savings grow rapidly to reach 2.2 Mtons CO<sub>2</sub> after 20 years

**RPB: As long as overall growth:drain ratios are 1 or more there will not be no carbon debt and bioenergy achieves net absolute savings from the start**

# Main study conclusions

- Methodological choices and scenario assumptions employed in models = huge role in determining outcomes
- When the data and assumptions from the field are used, models show that:
  - Wood pellets from BC Canada and SE US achieve significant GHG savings and make meaningful contribution to climate change mitigation
  - Carbon debt and foregone sequestration are very small compared to carbon savings that are achieved over time
- Critical difference between a small temporary “carbon debt” (when one might exist) and the permanent fossil carbon emissions savings achieved by use of bioenergy rather than fossil fuels

*This slide supplied by Fanny-Pomme Langue of AEBIOM*

# Communicating results

## Bridging with Biomass



Coalition “*Bridging with Biomass*”: gathers pellet producers from Canada, US and Europe so as to provide inputs from the bioenergy sector to EU Policy makers and other stakeholders on EU policy developments related to biomass

Need to explain what are the current practices of the bioenergy sector and how this sector works

## For more information

- [gord@pellet.org](mailto:gord@pellet.org)
- [www.pellet.org](http://www.pellet.org)

