Some Effects of Biogenic Energy on Wood Fiber Markets

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Approach

• Look at the general situation in forests with respect to the pulp and paper industry.

• Next, we examine the situation if wood becomes a major energy feedstock.

• Finally, we will provide some tentative implications.
Background for Pulp and Paper

• Traditionally, the major feedstock for pulp and paper has been wood fiber.
• Over the last several decades the world is seeing a transition in the wood supply source from naturally generated forests to planted forests.
• Planted forests have a host of advantages including control of location and species type, introduction of improve varieties, readiness for intensive management.
• These factors have resulted in
  – a relocation of facilities around the world, e.g., Brazil
  – using new species
  – a reduction of rotation age and
  – a general relative lowering of supply costs (Bael and Sedjo 2004).
The Global Picture

• Questions as to the level of future demand for pulp and paper.
  – Alternative communications competing with paper,
  – but also increased packaging due to more trade.

• New supply sources: Over the past several decades production in the pulp and paper industry has shifted to nontraditional regions such as South America and Southeast Asia.

• Also extensive plantings in China, India.

• Advent of serious bioenergy possibilities.
Forests and Carbon: Overview

- Forests are more than simply a fiber source:
- Play an important role in the global carbon balance.
- A huge amount of terrestrial carbon is sequestered in forests.
- Expanding the stock increases captive carbon and the reverse.
- Although global forests have been receding, US forest are expanding.
- Indeed, so most developed country forest are constant or expanding.
- Fifty percent of the forest decline is in two countries – Brazil and Indonesia.
- One proposed policy to reduce GHGs is to promote forest expansion, e.g., credits for carbon sequestered in forests.
Current Situation with Energy

• Increasing demands for energy
• Issues with fossil fuels:
  – economic availability,
  – security and
  – environmental,
  – Global Warming and GHG (carbon) emissions.
• Potential for renewables, including biogenics and wood, as well a solar and wind.
What is the Energy Potential of Biogenics?

• In very recent years biogenic materials, including wood, have emerged a potential new competitor as an energy feedstock – specifically – bioenergy.

• The US EIA has projected the future of bioenergy (including wood) to be huge.
We know that the future of bioenergy (biogenic feedstock) is expected to be huge

- 2009 3.72 quadrillion BTU
- 2025 7.0 ““
- 2035 9.0 ““

- Bioenergy
- 2010 8% of US primary energy consumption
- 2035 16% of US primary energy consumption

Source: Dept. of Energy EIA 2012
What are the Requirements of Biogenics?

• There are legal requirements that mandate biofuels production:
  – such as the **Renewable Fuel Standard** that support corn ethanol production and blending with gasoline.
  – However, the **Energy Independence Act**, which mandates increased ethanol production, also limits the total amount of biofuel that can be produced using a corn feedstock. Beyond that limit the **Act requires the production of cellulosic and other advanced biofuels**.

  Entre to issues like:

• **Cellulosic** ethanol can be produced using a variety of plant feed stocks including grasses and **wood**.

• Also, wood can be used for **combustion for electrical power** generation either by itself or in combination with a fossil fuel. Until recently there had been plans for the establishment of 50 or more wood feed electrical power facilities in the South.
The Forest Industry: Impacts on the pulp and paper sector?

• In an earlier set of studies we examined the question of: how important might be the increased demand for wood for the biofuel cellulosic ethanol.

• One study estimated that if all the increased ethanol posited in the EAI projections would come from industrial wood, the impact on wood prices would be substantial with increases approaching 20% by 2022. Of course, industrial wood is not the only biofuel.

• However, if wood for power facilities were also to become important, it is embodied in the Renewable Portfolio Standards (RPS) of some of the states, this would add to the overall pressures on wood supply. Let me present some of our preliminary results
Nationally, Forest & Cropland Expand with Pasture Conversion as Bioelectricity Increases
How is carbon released from bioenergy to be treated?

• An advantage of renewables is that its use is carbon neutral, e.g., wind, solar.
• But, using forest for bioenergy releases carbon to the atmosphere.
• So, the neutrality has been challenged.

• **So, which is it?? It depends.**

• IPCC has argued that growth offsets releases so carbon neutral.
• But, EPA is challenging that view.

• Some studies show that anticipating large future wood energy demands could result in expanded forest stocks.
• Note, a sustainable forest system, for example, generates a constant flow of timber, with the annual harvest equaling annual growth.
• **In the US the forest stock is expanding,**
Summary

• The forest industry is in a state of flux with new sources of its raw material supply found both in new planted forests and in new off shore locations. Questions as to the level of future demand for pulp and paper.

• Additionally, the pulp and paper industry may find itself with increased competition for its raw material from the energy sector.

• At the same time the future role of wood biomass for energy is unclear. Wood biomass could become an important energy source but it faces numerous competitors, e.g., grass and other biomass might out-compete wood in the energy sector.

• Also, how biogenic carbon emissions from wood are treated could have an important effect on the costs of wood energy effecting its competitiveness as an energy source.
Conclusions for Pulp and Paper

- Currently, the world appears to have **adequate supplies of wood fiber** for the pulp and paper industry. Indeed, some have characterized wood availability as reflecting a “wall of wood.”
- But, **biomass energy could put greater pressure** on supply.
- **Technology** allows for more pulp and paper product with less virgin fiber content, thereby allowing for the expansion of non pulp and paper fiber uses, without seriously compromising supply and allows increased forest productivity.
- The implications for the pulp and paper industry will depend importantly on **how important bioenergy from wood biomass is likely to become**.
- However, supply factors should allow for a **fairly orderly transition allowing for both** biomass energy and continuation of roughly recent price levels for the raw material.