Hardwood Pulpwood Markets: Demand Trends and Bioenergy Realities

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About Forisk Consulting

- Forisk provides management consulting and educational services to senior management and investors in the forest industry and timberland investing sectors.
- Founded in 2004.
- Key products:
  - *Forisk Forecast*
  - *Wood Bioenergy US*
  - *US Timberland Owner List*
- Books:
  - *Wood for Bioenergy* (Forest History Society)
  - *Forest Finance Simplified* (Forisk Press)
Topics

• Forest industry hardwood pulpwood demand.
  – Current trends in AR, LA and MS.

• Screening bioenergy projects.
  – Mandates don’t produce power.

• Wood bioenergy projections.
  – Potential hardwood pulpwood demand in AR, LA and MS.
Hardwood Pulpwood Removals: AR/LA/MS
1995 – 2011

Source: USFS (TPO)
Note: data for 1997 and 2001 incomplete; data shown is for previous year
Hardwood Pulpwood Demand: AR/LA/MS
2006 – 2013

Source: Center for Forest Business, UGA
Sources: Forisk Consulting, Forest Industry Shapefiles (UGA)
Bioenergy Projects: Screen for Success

• Technology
  – Does the project rely on proven or unproven technology?

• Status
  – Is the project under construction or operating?
  – Is the project on hold or is the plant shut down?
  – Has the project received/secured/signed **two or more** of:
    • Financing
    • Air quality permits
    • EPC contracts (Engineering, Procurement & Construction)
    • Power purchase agreements for electricity facilities
    • Interconnection agreements for electricity facilities
    • Wood supply agreements
    • Location
Bioenergy Demand: US Case Study

- Projects: 442 → Expected: 290 (66%)
- Wood demand: 122.6 MM → Expected: 80.9 MM (66%)

Source: Forisk Consulting, as of December 2013
In 2011, Forisk evaluated 36 liquid fuel projects across three US regions.

• Estimated commercial timeline for 12 technology types

Where are these 36 projects today?

- Cancelled: 12
  - Includes one demonstration plant and 11 commercial plants
- Still in planning stages: 8
- Still under construction: 4
- Shut down: 3
- Operating pilot plants: 6
- Operating demonstration plant: 1
- Operating commercial plant: 1
  - KiOR: not operating at full capacity yet
- Sold and in the planning states: 1
  - LanzaTech purchased Range Fuels plant
Wood Bioenergy: Why do projects fail?

U.S. Bioenergy Plant Progress; Dec 2010 - Dec 2013

Source: Forisk Consulting, as of December 2013
Total Wood Consumption by Bioenergy Plants in AR, LA, and MS

Hardwood Pulpwood Consumption by Announced Bioenergy Plants: AR/LA/MS