Balancing Biomass Feedstock Cost & Quality

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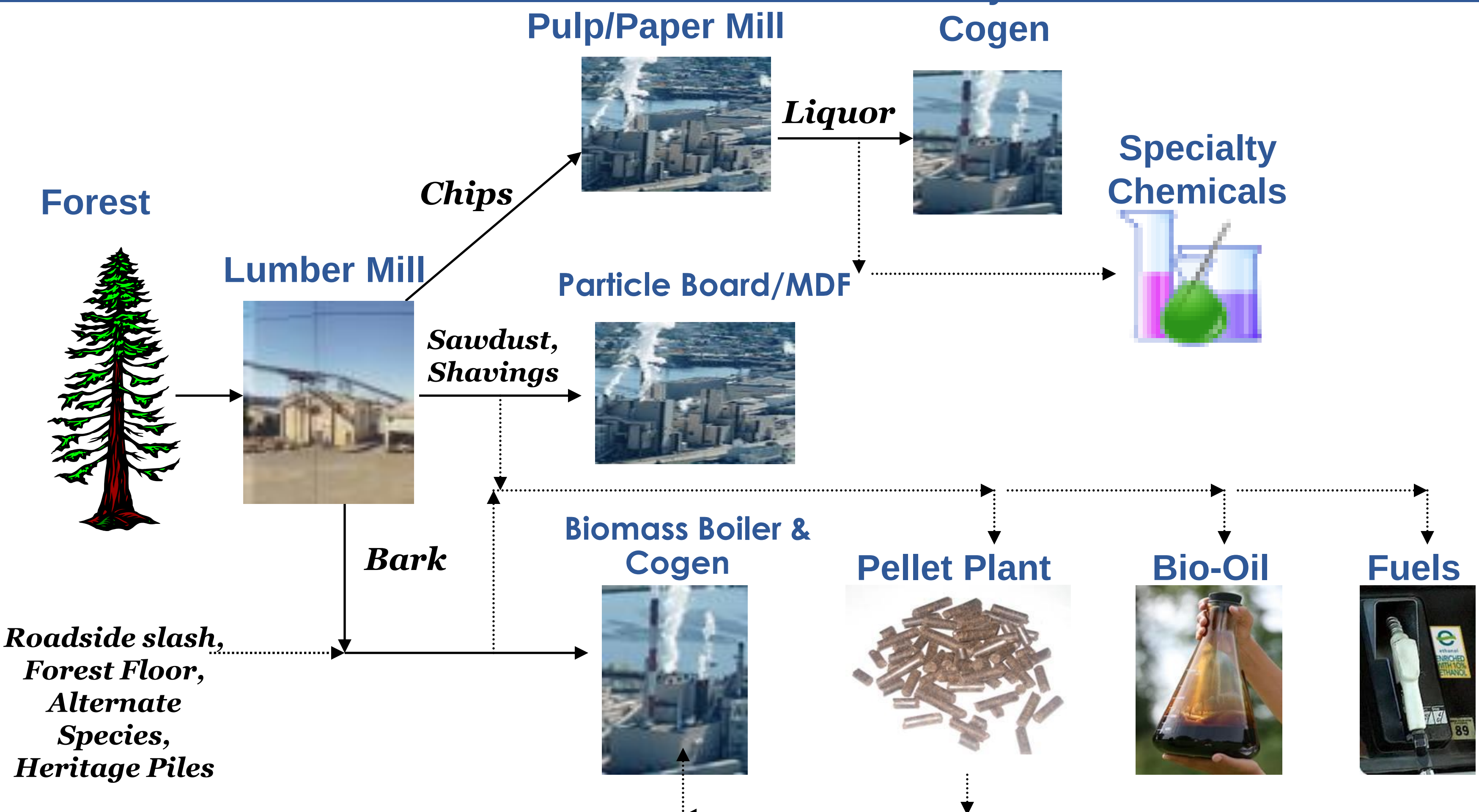
LinksEdge
Ltd.

Overview

- Biomass Value Chain
- Customer Expectations
  - Quality
  - Wood Cost
  - Value
- Opportunity

Biomass Value Chain



Customer Expectations - Quality

- Quality to meet product needs
  - Traditional users exist to utilize the majority of the higher quality part of trees – “inner part of the tree”
    - Veneer
    - Pulp & Paper
    - Veneer
    - Lumber
    - OSB
  - These have supported secondary bi-product users for sawdust, shavings, and bark
    - MDF
    - Particle Board
    - Electricity Generation
    - Pellets

Customer Expectations - Quality

Customer Expectations – Cost / Value

- Cost Expectations Traditional
  - Predictable
  - Reliable
  - Sustainable
  - Economic Supply
    - Total delivered costs that allow for margin contribution even in depressed commodity
    - Offering suppliers a reasonable rate of return on their investment with rate determination models at 6-10%

Customer Expectations Traditional

Kraft Pulp Mill		Sawmill	
	$/bdmt		**$/m3**
*Delivered Pulp Wood	$125 (or $50/m3)	*Delivered Wood	$50
	$/admt		**$/Mfbm**
Production Cost	$350-450	Production Costs	$200-300
Total Product Cost	$650-750	Total Product Cost	$250-350
Mills Net Price	$600-800	Mill Net Price	$350-375
Net Contribution (Profit)	$(150)-$150	Net Contribution (Profit)	$0-125

Cost / Value

- Depending on type of material fibre costs have a very broad range but are not free
  - The range on a delivered average is from:
    - $30 to 150 / bdmt in a useable
  - The lowest is simply bark that is not self generated or in a adjacent facility

Customer Expectations – New Entrant

- What are you really looking for?
- What part of the tree?
- Are you looking for something that another customer exists today and you are willing to compete?

- Traditional users may change simply due to market conditions but price competition will drive that outcome.

Opportunity

- Synergy on a forest level
  - Utilize currently "un-merchantable or un- marketable material"
    - Under utilized species
    - Slash
      - Tree tops
      - Branches
      - Bark
      - Leaves & Needles
  - As well as merchantable fibre that is also underutilized

Whole Tree Chippers

In Bush Chipping

Grinding

Whole Tree Micro Chipping

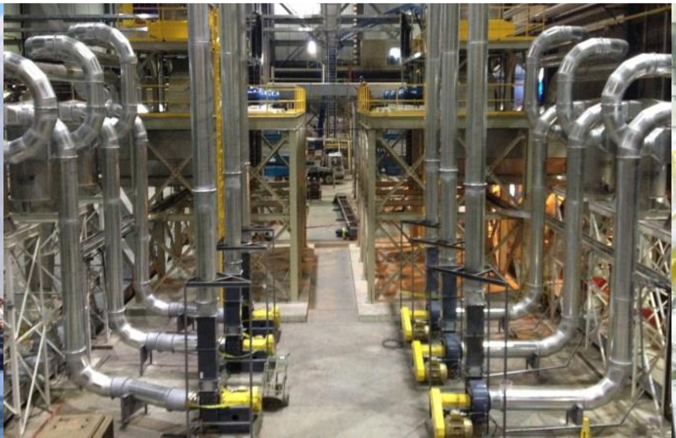
Whole Tree Material





	WAWA	ATIKOKAN
Capacity	450,000 MT	110,000 MT
Customer	Drax (400k)	OPG (45-90k)
Start of Commissioning	April 2015	February 2015
Feedstock	Mixed Hardwood & Harvest Residuals	Mixed Hardwoods & Sawmill Residuals

Rentech acted as General Contractor and self managed both projects


Slash Utilization

Rentech

- Improved utilization
  - 20-25% gain in volume from the forest
- Achieving full industrial pellet quality from whole tree micro chipping
  - Including bark
- Improves economic perspective by improving efficiency

Key Success Factors

- Right Economy of scale
  - Users
  - Suppliers
  - Forest
  - Distance

Questions

- Contact Information

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