



## Forest Value versus Tree Value

October 2011



### Outline

- Tembec Overview
- Economics & Markets
- Tree vs Forest Value
- Conclusions - Ideal Outlook

The Tembec logo is displayed in white text on a blue rectangular background. The background of the slide features a stack of white, ribbed sheets, possibly paper or plastic, with a blue horizontal band across the middle.

# Tembec

## Overview

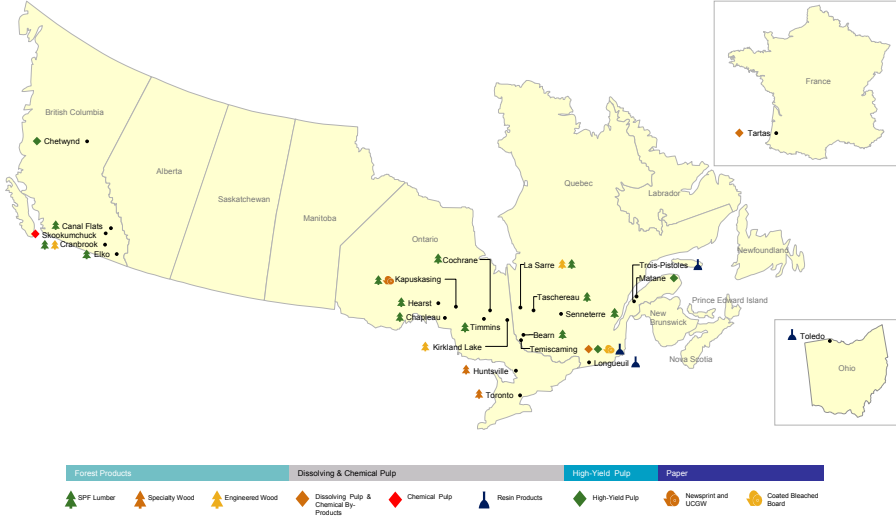
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# Tembec

### Company Overview

- A leading integrated forest products company in Canada
- Annual sales of over \$2 billion
- 6,000 employees
- 30 sites primarily located in Canada & France

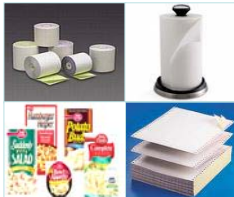
## Geographic Footprint



## A Leader in FSC-certified Pulp



**CELLUTIONS**  
Specialty Cellulose Pulp  
310,000 tonnes



**Northern Bleached Softwood Kraft (NBSK) Pulp**  
270,000 tonnes



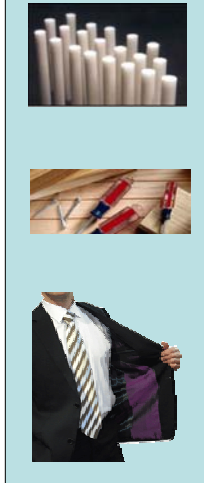
**High-Yield Pulp**  
805,000 tonnes

**Specialty Pulp Applications**

**Cellulose Ethers**



**Cellulose Acetate**



**Nitrocellulose**



**MCC**



**Specialty Fluff**



**A Leader in FSC-certified Wood Products**



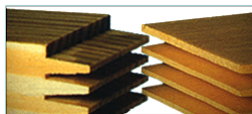
**SPF Lumber**  
1.6 Billion Board ft



**Hardwood Lumber**  
30 Million Board ft



**Hardwood Flooring**  
20 Million Board ft



**Engineered finger joint  
lumber**  
90 M Board ft



**Wood Chips**  
1.6 Million Bone Dry Tonnes

## A Leader in FSC-certified Paper Products

### Coated Bleached Board 180,000 Tonnes



**Newsprint**  
**330,000 Tonnes**



**Kallima Coated  
Cover Grades**



**Premium Bleached  
Linerboard**

## Chemical Products Group



**Ethanol**  
**15 Million Liters**  
**Hydrochloric Acid**  
**30,000 tonnes**



**Lignosulfonates**  
**175,000 tonnes**



**Phenol-Formaldehyde  
Powder & Liquid Resins**  
**210,500 tonnes**

**Amino Resins  
Powder & Liquid**  
**33,600 tonnes**



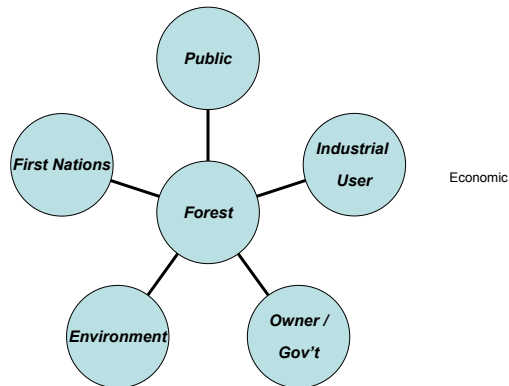
## Forest Economics / Value



### ECONOMICS

- SUPPLY & DEMAND drives price
  - End product
  - Intermediary product
  - Trees
    - ◆ Products from trees
- + CONSTRAINTS also influences price through actual costs or affordability
  
- Excessive price also can lead to substitution or new market entrants

## Forest Utilization Drivers – (Constraints)



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## DEMAND – MARKET – END PRODUCT

- Lumber (SPF, Hardwood, Specialty), OSB, Flooring
  - NA Housing Market
- Substitution from
  - Steel & concrete
  - Energy sources (Fuel / Electricity)
    - ◆ Coal, Diesel, ...
- ALL DRIVEN ON CONSUMER AFFORDABILITY OR PERCEIVED AFFORDABILITY
  - Substitution of similar more affordable products (eg. Off shore flooring)

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## Markets

- Softwood Sawmills
  - Less than 0.5 million US housing starts and predicted to continue
    - ◆ Peak in 2005 over 2.0 million
  - Canadian capacity – 45-55% today
- Hardwood & Specialty sawmills
  - Closures and mills operating at 50% capacity
  - Housing market dependent but large influence in reduced markets due to permanent furniture manufacturing closures
- Flooring
  - Operating at 50-60% influenced by high competition from off shore and from US with current exchange rate

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## Markets

- OSB
  - Significant mill rationalization and temporary
- Kraft Pulp
  - Balanced supply & demand with favourable trend pricing over \$850 / admt
    - ◆ Balanced due to medium sized permanent closures
- Specialty Pulp
  - Favourable market with pricing in excess of \$1500 / admt
    - ◆ Commodity portion softening but long term trend very positive

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## Market Relevance

- Why are markets important?
  - Only a few mill are able to economically operate as experience in the last few years with severely depressed lumber markets
    - ◆ Best in class manufacturer
    - ◆ Lowest cost forest
  - ◆ In either case, mills that have operated knew their wood supply extremely well to predict their ability to financially operate
    - Products available from the forest and volumes
    - Cost to extract the products from the forest

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## FOREST PRODUCTS m3 – Cost Drivers

- Distance & Infrastructure
- Efficiency / Productivity
  - Type of harvesting prescribed and required equipment
  - Labour / Fuel ...
- Administration & Forest Management Costs
- Stumpage and renewal expectations
  
- Volume per hectare or per km of road
- Economies of scale
  - 1 m3 per forest for the highest value tree will not be enough to support all of the management and infrastructure costs of a forest

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**In Bush Chipping – Nipissing**  
**Attempting to make trees affordable for pulp**



**Chipping Debris Pile – Nipissing**  
**Chipping Residual for energy & heat**



## Grinding – Nipissing Residual limbs / tops for heat and energy



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## FOREST PRODUCTS m3 – Cost Drivers – Manufacturing Affordability

- Sawmills have been designed with a specific log requirement
  - Multiple lines to manage multiple diameters and log lengths
    - ◆ Drives productivity
    - ◆ Balance the remainder of the process debarking, sorting, drying, planer capacities.
- Predicting the actual supply drives operating decisions and drives future investment

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Romeo Malette Forest operational cruising conducted early 2000's  
To determine average diameter size class across the forest license

It was found that there were plenty of larger diameter trees available  
Sawmill removed the small log line and replaced with a large diameter line

Over the following years it turned out that small-medium trees mostly fed sawmill  
Small log line was purchased with plans of running both small & large lines  
Sawmill ran in-efficiently for a # of years and indefinitely closed in 2006  
Small line was never installed in sawmill and to this day, not in use.

After transferring LIDAR data into our 5yr Harvesting Plan  
an average diameter of 16cm (across all species) is what exists on the RMF.

Having had this info available for the mill managers a proper  
solution could have been implemented at the Timmins Site.

### FOREST PRODUCTS m3 – Cost Drivers – Manufacturing Affordability

- Costs tend to be reality but efficiency of utilization also allows the ability to manage higher costs
  - Example: Lumber recovery through investment = more product per m3 of input
    - ◆ Need to know what is available to assess the proper investment
- Manufacturing capabilities need to be on a world class scale as best in class to run through the worst markets
  - Example: Medium sized pulp and OSB mills did not last as fibre costs increased over the last 5 years



## Tree Versus Forest Value



### Tree Versus Forest Value

- Real or Perceived management objectives long term
  - Great Lake – St. Lawrence Forest (GLSL)
    - ◆ Maximize tree value mixed wood forest
      - Develop trees per stand to generate highest value
        - » veneer and saw logs
  - Boreal
    - ◆ Maximize value through optimizing long term growth volumes and productivity per area
- Both forest types do meet the CFSA requirements
  - Produce a sustainable volume while balancing all other stakeholder needs

## Tree Versus Forest Value - Improvements

- Tree value
  - Thinning & Selective harvesting
    - ◆ Low volume per hectare / km
    - ◆ = higher price
    - ◆ = less interest
    - ◆ ? If selective is effective in the long term ?
- Forest value
  - increase volume per hectare / km
    - ◆ = lower price
    - ◆ = potential economic value
    - ◆ - potentially less high value material

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## HARDWOOD TREE PRODUCTS

- Veneer
- Saw Logs – 16 to 8 foot
- Pulp Wood – 8 to 16 foot
- Biomass
- ...
- Underutilized today
  - Tops, Limbs, and branches

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### Forest Biomass (Partial Harvest) - Nipissing



### GREAT LAKE – ST. LAWRENCE HARDWOOD FOREST + R&W PINE

Product	% Available From Forest	% Demand of Available	Value 10 Years Ago (\$/m3)	Value Today (\$/m3)
Veneer	5-10%	0-5%	\$250	\$100-150
Saw logs	10-20%	10%	\$100-120	\$60-70
Pulp wood / OSB	40-50%	30%	\$30-\$40	\$40-50
Biomass – Limbs	20% (above merchantable)	2%	\$10-30	\$15-35 (affordable limit)

## BOREAL – SPF, POPLAR, BIRCH

- Veneer
- Saw logs
- Pulp wood
- Biomass
  - Underutilized today
    - ◆ Limbs and branches

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## BOREAL FOREST SOFTWOOD, POPLAR, BIRCH

Product	% Available From Forest	% Demand of Available	Value 10 Years Ago (\$/m3)	Value Today (\$/m3)
Veneer	5-10%	10%	\$250	\$80-120
Saw logs	20-30%	50%	\$40-45	\$50-60
Pulp wood / OSB	30-40%	20%	\$30-\$40	\$35-45
Biomass – Limbs	15-20% (above merchantable)	2%	\$10-30	\$15-35 (affordable limit)

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## REALITY TODAY – ADJUST TO MARKETS – GLSL Harvesting Type

	2000 (%)	2010 (%)
Selection	70%	10%
Shelter Wood Regeneration	10%	40%
Shelter Wood Final Removal	10%	30%
Clear Cut	5%	10%
Seed Tree	5%	10%

Note: Selection Reduction driven based on reduction in actual regeneration results and from a pure productivity to improve cost performance

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## SHORT TERM MARKET OR LONG TERM SHIFT

- Improve Demand
  - Traditional markets to return as population grows
    - ◆? Will markets improve?
      - Yes to softwood lumber
      - ? Hardwood furniture manufacturing ?
      - ? Hardwood Flooring – Solid versus veneer / imports off shore
      - ? Solid wood moulding and trim vs. Composite
  - Improve use of wood
    - ◆ Utilize wood in non-traditional areas
      - Structural – example CLT

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## SHORT TERM MARKET OR LONG TERM SHIFT

- Pulp
  - Relies on having a primary break down business
  - 100% tree operations not viable in Canada due to cost structure
    - ◆ Residual or at least other forest users required to balance affordability point
    - ◆ Eg. Specialty Cellulose – strong market – 90% based on sawmill residuals
- Overall, the forest needs multiple users and multiple m3 products
- Known volume, species, and products per operating block decide if economically viable to operate or not.

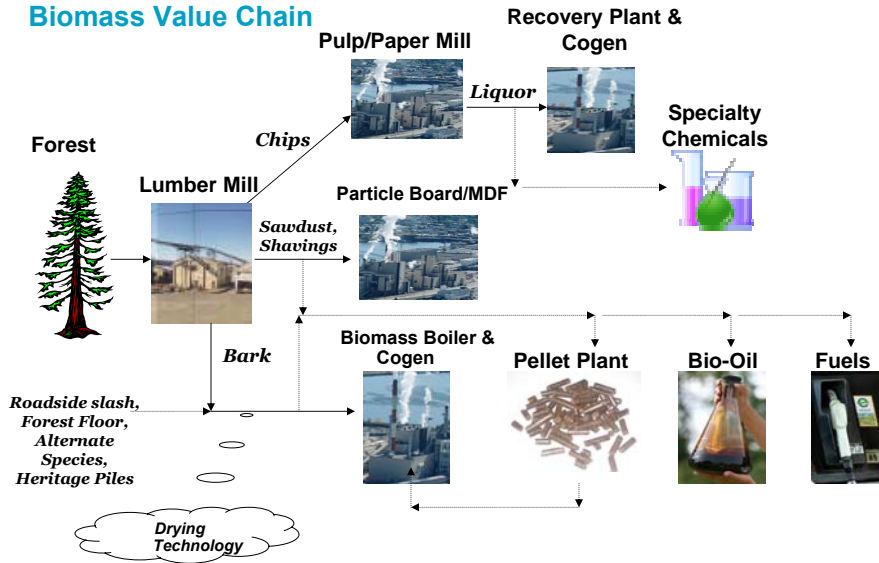
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## NEW VALUE

- Improved processes / efficiencies
- Improved utilization
  - Underutilized species
  - Limbs and Tops
- New Uses / Users
  - Fuel and energy related
    - ◆ New technology to improve the efficiency to allow new products to be produced from trees at an affordable price

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### Biomass Value Chain



## Conclusions

- Value is really what the end consumer can afford or desires to afford
  - Challenge today is the NA market is poor for lumber – softwood / hardwood
  - NA social / economic status is high but drives an expectation of high labour rates which drives up product prices for made in North America
    - ◆ Therefore substitution occurs
      - Flooring
      - Furniture
      - ...

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## Conclusions

- Future requires an improved economy of scale or focused productivity per area
  - Optimized product flow from the forest – FULL VOLUME UTILIZATION PER BLOCK AND FOREST
    - ◆ Should there be higher intensity areas of the forest and lower intensity?
    - ◆ Should plantations be considered on private or public land?
    - ◆ ...
- New technology and new processes to improve yield

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## Conclusions – Forest Information - Products

- High Quality Information
  - Product Predictability - Knowledge of exact products
    - ◆ Veneer quality with diameter distribution
    - ◆ Saw log volume, by species, lengths, and grades
      - 16, 14, 12, 10, 8
    - ◆ Pulp wood / OSB
      - Volume by species, size / diameters, and quality per area
    - ◆ Limbs & Tops
      - Volume per area
    - ◆ Eg. LIDAR taking the next step to estimate products from inventories as well
  - Ability to assess economic viability

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## Conclusions

- Buy lumber, buy green energy, and stop buying from off shore manufacturers.

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# Questions?

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