Visions of the Future
Forest Products Industry

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The Forest Products Industry of the Future?

Significant changes are likely in next twenty years.

How can we encourage technology breakthroughs that lead to major positive transformations?

Many studies, reports, visions, and roadmaps offer valuable insights.

What can we learn from these reports?

- Messages from reports
- *My views and opinions*
Transforming the forest products industry through innovation

Visions – Industry-Sponsored

- Better Practices, Better Planet 2020 AF&PA
- Canada: Vision 2020 FPAC
- Canada: Bio-Pathways FPAC
- FPI Tech Roadmap Agenda 2020
- Europe: Unfold the Future 2050 Low-Carbon Roadmap CEPI
- Europe: Horizons – Vision 2030 EU FTP
- Europe: Strategic Research Agenda for 2020 EU FTP
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Visions – Not Industry-Specific

- Global Trends 2030 National Intelligence Council
- Vision 2050: New Agenda for Business WBCSD
- Manufacturing the Future McKinsey
- Future of US Research PCAST
- Capturing Advantage in Advanced Manufacturing PCAST
Forest-based products – both traditional and new – are a promise for the future

Worldwide demand of traditional paper products grows 1.5% per year for next 40 years
  • Largest growth rates in China and Southeast Asia
  • Steady growth in packaging grades
  • In printing and writing grades, rates of decline peak in 2015-2018 but demand continues declining at least to 2030

Global pulp shortage in 2020: 5-7 million tons per year
  • Especially softwood

OUTLOOK: Positive
Global population: 6.9 billion now, 9 billion in 2050

Global urban population doubles by 2050
  • 60% of people in urban areas in 2030

More middle class, more consumers, older population

Employment in manufacturing declining in all advanced economies

Uncertainties about security, economies, conflicts

**RESULT:** Stress on ability of industry to deliver traditional products and new products efficiently and sustainably – will cause large changes
Forests and Wood Supply

Sustainable forestry is a necessity

Wood removals in 2050 three times current rate

Forest plantations are more productive than natural forests and will become larger portion of global wood supply

Will GMO trees be allowed?

• Biotechnology can grow superior trees faster
• Europe sees little impact by 2050
• ENGOs voice concerns

**ASSESSMENT:** Wood likely will be available next 20 years for traditional and new products

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The Biobased Economy

Forest resource is excellent foundation for the “bio-economy”

Driven by society’s push for renewable, sustainable, . . .

Much entrepreneurial activity underway – leading to jobs and economic growth, benefits in rural areas

Opportunities for $200 billion a year in sales of forest-derived bio-based products in 2015

• $70 billion in green chemicals, bio-plastics, $60 billion in biofuels and alcohols, $70 billion in fiber composites

Forest sector can’t do it alone

• It must partner with other sectors and industries
• Needs favorable governmental policies
Many calls for a sustainable industry – *long way to go*

Customers demand better sustainability metrics

Renewable fuels – good progress, right direction
  - Carbon emissions from renewable fuels a potential policy issue

Not enough attention to energy and water footprints
  - Concerns growing about future access to water
  - Technologies to reduce water use per ton not widely used
  - Little or no recent progress in energy use per ton

EPN chart for 2000-08
Pulp and Paper Mills

North America has world’s oldest fleet of bleached kraft pulp mills

Many mills with recovery boilers over 45 years old
  • 20 million tons per year in North America

Older mills may be repurposed or closed (200 at risk worldwide)

Mills with poorest carbon footprints are in jeopardy

New mills will be built, but not likely in southern US, even though wood is available, due to permitting issues

QUESTION: Will mill age in North America lead to new investments in next 20 years with best current technologies?
Implications for Pulp and Paper Mills

Recovered fiber will be larger share of furnish
- Higher waste recovery rates, lower fiber quality
- Impacts on strength and runnability

Mills will become host platforms for bioproducts
- Synergies for reducing energy, water, wastes, capital
- Existing infrastructure

Mills may combine with other sectors – chemicals, steel, cement, waste

**Mills must significantly reduce energy, water, emissions, and wastes to satisfy future expectations of society**
Advice to the Industry

• Look to the future – don’t dwell on invested capital
• Move beyond the “production at lowest cost” attitudes of the past 20 years – can’t “cut your way to prosperity”
• Be agile and adaptive
• Partner with other sectors
• Transformation requires investments in people, knowledge, and leadership
Breakthrough Technologies

Best available technologies are not sufficient

Vision reports call for breakthroughs in many areas – e.g.,

- Energy in pulping and papermaking
- New products from forest resource

Past 100 years saw many breakthroughs:

- Chemical recovery boiler, pine kraft pulping
- Extended-nip press, blade coater, hot soft calender
- Forest productivity

Long time horizons in our industry – Be patient!
(e.g., nanotechnology)
Necessity of Invention

Will we see new breakthroughs in coming 20 years?

The R&D pipeline for breakthroughs is nearly empty

New technologies are needed by 2030 to impact 2050

Too few good ideas for research proposals

- Heat demand in pulping and papermaking
- Lighter weight paper and paperboard
- Performance with less long fiber, more recycled
- Advanced manufacturing
- Information and control technologies
- Biotechnology
- Nanotechnology
Industry: *Lacks capacity for R&D beyond immediate needs*

Government: Too much Federal R&D money being used for incremental steps rather than radical changes (*and low amounts to the forest products industry*)

Universities: Performing more applied R&D and less basic research and knowledge generation

*Where will new breakthroughs come from?*
The vision of a vibrant future industry offers many business opportunities

*Industry’s leaders must choose to pursue the vision*

- Adopt positive attitudes about transformation
- Allocate sufficient people and money for innovations
- Reach out beyond our industry
- Work together on common areas for progress while respecting proprietary positions
- Take advantage of public funds for industry R&D
- Manage with long-term perspective
Conclusion

What will the forest products industry be like in 20 years?

- Growing global demands in traditional products
- Opportunities abound for new bio-products
- Impact of technologies likely incremental and not radical (Near-empty pipeline, long development times)

Extrapolating from past 20 years suggests mills and products similar to those today

New breakthroughs are needed but resources to develop them are not sufficient today
Your Comments?

For More Information

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