Road Map Summary

Value to Wood

Challenges and Opportunities for Wood Office Furniture Manufacturers

Photo: Artopex

A team of researchers interviewed Canadian wood office furniture manufacturers for their vision of their industry and the innovation needed to support its continued health. The team then consulted key university and Forintek researchers to review the challenges facing the industry and to brainstorm for additional innovations. The information presented in this report is part of a larger work, "Roadmap for the Canadian Value-added Industry" available from FPInnovations – Forintek Division.

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The Wood Office Furniture Industry At-a-Glance

- In 2003, Canadian office furniture shipments were $4.5 billion, of which wood office furniture accounted for $1.25 billion.
- Approximately 40% of this furniture production was exported. In 2006, 97% of it went to the US.
- Most Canadian wood office furniture is produced in Ontario (50%), followed by Quebec (30%) and Alberta (13%).
- Wood office furniture exports to the US dropped 18% ($609 million) from 2000 to 2006, a drop reflected across all sectors of the Canadian office furniture industry.
- The weak US dollar coinciding with the surge in Chinese furniture imports has impacted the Canadian industry in both export and domestic markets.
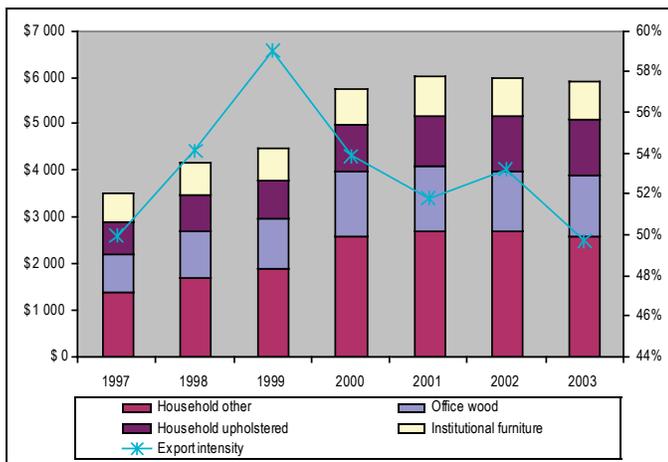
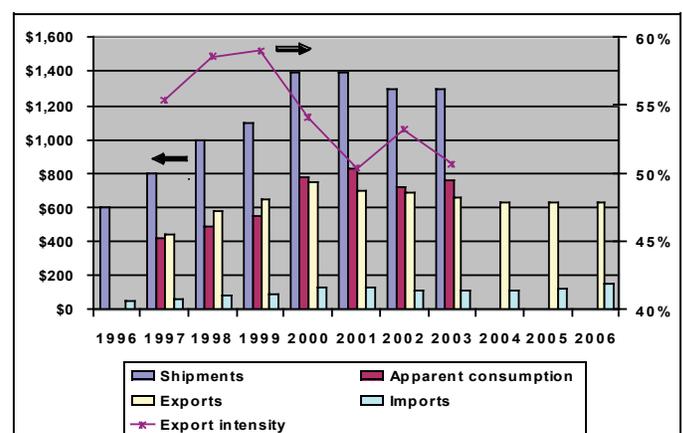Canadian shipments of furniture (in $ millions)
Source: Industry Canada, 2006.
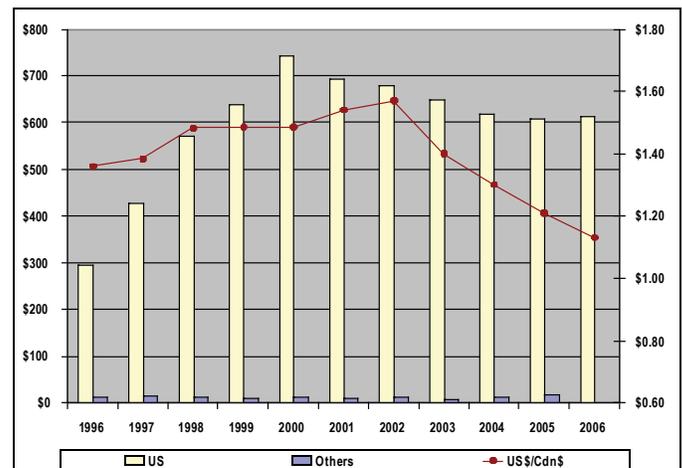
Canadian exports of wood office furniture (in $ millions)
Sources: Industry Canada and Bank of Canada, 2007.
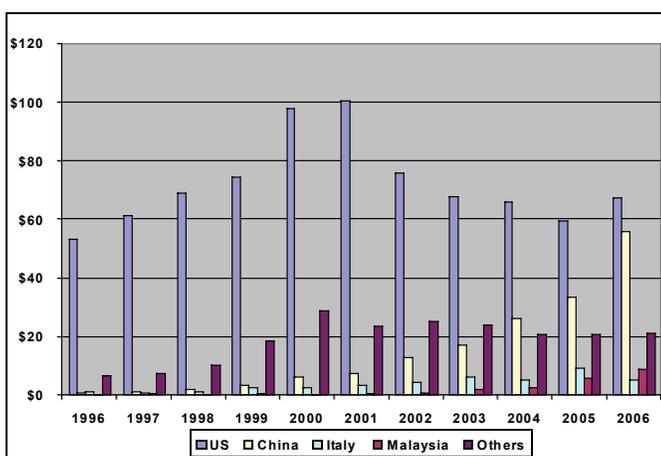
Canadian imports of wood office furniture.
Source: Industry Canada, 2007.

Statistics for wood office furniture industry in Canada.
Source: Industry Canada, 2006.

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Industry Vision and Driving Forces

Newly Emerging Economies

Foreign manufacturers of commodity products (e.g., lumber, particleboard, MDF, etc.) are increasingly exporting their products into markets traditionally supplied by Canadian industries. The emergence of these economies, coupled with a weak US dollar, forces Canadian manufacturers to target different market segments or offer additional service attributes to differentiate their products from those coming from countries with low manufacturing costs.

According to manufacturers…

- Wood office furniture manufacturers have a larger proportion of custom business (through specifiers and architects) than household furniture manufacturers. This has delayed the encroachment of Chinese imports into their markets, but these imports are now increasing.

Resource Issues
(supply and characterization)

Aside from the decision to change species for financial reasons, many appearance wood products' manufacturers are being forced to change their materials and grades mixes because their historical raw material supply has changed in quality and/or price, thus influencing their ability to deliver the same products. This situation presents multiple challenges and opportunities.

According to manufacturers…

- Panel shortage is a serious issue in the office furniture industry. This issue is compounded by the fact that most companies need the same panel sizes. Fibre supply for domestic composite panels is shrinking rapidly because of recent mill closures. The domestic supply of composite panels is being pushed out by new larger overseas mills. Many companies continue to buy their panels via traditional distribution channels (i.e., not direct).

- It is crucial that imported panels meet domestic standards which also include the soon to be implemented California formaldehyde standards. The composite panel industry is still not taking formaldehyde issues seriously despite the fact that California is very close to enacting a low formaldehyde emission tolerance.

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Customer Focus
(consumers, homebuyers, designers, etc.)

Consumers are becoming more and more educated about the products they buy. Widespread access to the internet makes it easy to obtain third-party information about various products and compare them quickly. Simultaneously, the current North American demographic profile is contributing to the emergence of a market segment that is looking for high-end customized products, and, more importantly, that has the ability to afford them.

According to manufacturers…

- Canadian manufacturers are aiming at 'executive' furniture, i.e., high-end office furniture. Finish is a critical success factor for this market segment.

- Upcoming product trends include the integration of technology in furniture (i.e., digital imprints linked to workstations).

- Some manufacturers only ship complete units which entails wrapping/cartoning. This additional step in the manufacturing process is resource intensive, expensive and forces furniture manufacturers to deal with movers.

- Office furniture manufacturers lack the ability to forecast market trends, thus they have trouble adjusting their production and material inventory to market demand. Customer Focus (consumers, homebuyers, designers, etc.)

Environmental, Health, Social and Governance Issues

Partly in reaction to the challenges posed by newly emerging economies, but also from legislative measures put in place in Western countries, the Canadian value-added industry is reconsidering its raw materials, components and practices to ensure that they are less harmful to the environment and that they pose a negligible risk to consumer health. Similarly, consumers are increasingly demanding that products imported from other countries respect human rights (outsourcing) and come from wood that is legally harvested.

According to manufacturers…

- Neighbourhoods growing around existing industrial parks force governments to impose stringent environmental regulations due to nearby housing.

- Companies exporting to New York City must ensure that the packaging from their product is removed from the city, if not the product will be returned to the manufacturer.

Manufacturing and Cost Efficiencies

Cost reductions and increased efficiency are permanent drivers of innovation in the Canadian value-added wood products industry. Historically, improvements in this area focused on finding low-cost alternative materials as well as designing technology that could perform manufacturing operations faster, more precisely and at a lower cost than using manual labour. Similarly, improvements were continuously sought with regard to the actual operations performed in factories, i.e., scanning (optimization), sawing, gluing, laminating, sanding, finishing, assembly, etc. However, today's search for efficiency gains encompasses the whole spectrum of operations and material inputs used by a company (i.e., packaging).

According to manufacturers…

- Outsourcing components is a fairly common practice in the office furniture industry. Canadian manufacturers also make components for US companies. In general, most companies will outsource work for a while before opening a facility.

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- Many companies have implemented lean manufacturing or are investigating how it could apply to their business. Thus, a sizeable proportion of the industry has switched to smaller and more versatile equipment. Companies share technology information fairly well via their contact networks.

- Issues in manufacturing include sanding and other operations that have a direct impact on finish quality. Profile sanding is expensive and the quality of finish required is not up to par. Most finishes used are solvent-based as there remain problems with water-based finishes. There have, however, been significant improvements in veneer splicers in recent years.

- Improvements in panel processing could be made. For example, panels could be tracked through the finishing line using computer chips since written part numbers are covered up or removed during the finishing process.

- Industry trends in manufacturing include the design of standardized components (modularity) and the use of EMOSS. EMOSS is a parametric-based drawing design tool with a database of product rules instead of product numbers. It allows for rapid specification and drawing of projects and it reduces the complexity of inventory systems.

- Lack of skilled labour limits the office furniture industry's growth. Apprenticeship programs do not correspond to the expectations of both the industry and apprentices. This situation can result in the start-up of competing shops.

- Overall, the industry would benefit from being less fragmented (especially in the Maritimes); a critical mass could then be obtained and partnerships could be developed with component manufacturers.

- Office furniture manufacturers sometimes have difficulty obtaining consistent products from their suppliers. For example, grit in sanding belts can be a critical issue given the importance of finish in the office furniture business. As a result, quality control becomes a considerable challenge.

- Packaging weight is a concern shared by many companies (and value-added industries).

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Top Six Innovation Needs and Priorities of the Appearance Product Industry

- Increasing the industry's design and product development capacities
- Developing enhanced finishing products and methods
- Improving the industry's understanding of business models
- Providing the industry with relevant and up-to-date market intelligence
- Developing improved methods for sanding and surface preparation
- Resolving and capitalizing on environmental and social responsibility issues

Innovations for the Wood Office Furniture Industry

Incremental innovations are refinements or improvements to existing technologies, products and processes. **Breakthrough innovations** are totally new ways of thinking and doing. They represent significant departures from current processes, technologies, equipment and products used in the industry.

The lists below represent only some of the innovations identified in this project. Please consult the *Roadmap* for a more extensive listing of possible innovations.

Market Access / Intelligence / Competitors

Incremental Innovations
- Evaluate importance of service attributes in furniture value (selling price).
- Develop marketing approaches that are targeted to key demographic segments (e.g., women as decision-makers).
- Identify business models that are sustainable in North America. Focus should be on customer input (customized products and market pull product development), speed of delivery and low production costs.

Breakthrough Innovations
- Implement a system allowing furniture manufacturers to have access to up-to-date market intelligence for furniture, production, trends, etc. on demand. This information would certainly play a critical role in planning business development strategies (short- and long-term).
- Develop furniture based on functionality and user needs (e.g., ergonomics).
- Assess the market benefits and feasibility of environmental certification in wood office furniture—products targeted to homebuilders, architects and designers.

Material Supply and Properties

Incremental Innovations
- Develop a grading system that corresponds to the needs of furniture manufacturers, i.e., one clear face without length requirements (wood used in furniture is normally fingerjointed anyways).
- Reduce costs related to wrapping and packaging furniture.
- Develop panels tailored to the needs of furniture manufacturers.

Breakthrough Innovations
- Reduce work surface costs, handling difficulties and transportation costs by identifying ways to produce honeycomb and foam core boards with minimal production and equipment changes.
- Explore the possibility of having sawmills scanning and bar-coding planks contained in wood bundles for their clients. Furniture manufacturers could then truly match product order and material constraints (hardwood supply at any given time). Sawmill and furniture manufacturers would likely have to share the same optimization software.

Design and Product Development

Incremental Innovations
- Encourage design of products that assemble/disassemble easily and that can be recycled.
- Develop efficient and flexible packaging solutions.
- Develop dark laminating papers that have scratch resistance equivalent to lighter papers.
- Develop product testing protocols and product benchmarking to facilitate innovation.
- Investigate design platforms/systems that integrate the entire product development process. The system should reduce the product development cycle.

Breakthrough Innovations
- Make mass-customization of furniture possible using a product configurer that is user-friendly, i.e., asks a series of questions and proposes furniture component combinations (modular).
- Identify potential for the integration of technology in furniture (home cinema, personalized ergonomic adjustments with fingerprint ID, etc.).
- Develop water-based finishes that do not result in raised grain.

Technology and Manufacturing

Incremental Innovations
- Provide unbiased 3rd party information on the performance and properties of cutting tools and other machines used in manufacturing (e.g., machine speeds and materials). Current sources of information come from equipment manufacturers.
- Explore best practices and limiting conditions of water-based finishes.
- Develop finishing that reduces the number of steps in the painting process.
- Control changes in the formulation of finishing products via a third party.
- Reduce costs related to wrapping and packaging.

Breakthrough Innovations
- Investigate the possibility of using magnetic implants to replace tracking numbers printed directly on panels.
- Develop the ability to group cutting commands (different orders using same material) to minimize machine setups.
- Develop the use of laser technology to cut furniture components.
- Optimize chop saw operations according to optimal end use and color matching using artificial vision and scanners (for industrial use).
- Automate finishing so that it adjusts to wood colour.

Environment and Social Responsibility

Incremental Innovations
- Identify and solve problems related to gluing of low or formaldehyde-free boards.
- Develop a guidance document to facilitate the use of green components.
- Develop standards to present green building data for individual products.
- Improve knowledge of trends in corporate social responsibility as well as environmental, social and governance issues.
- Study volatile emissions of wood products (epidemiological research on VOCs other than formaldehyde).

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Breakthrough Innovation

- Assist the Canadian forest products industry in the transition towards green building certification and the development of green building compliant building materials.

Skills and Training

Incremental Innovations

- PC-based distance education is needed for workers. Potential topics include (but are not restricted to): wood as a material, equipment currently available, typical processes in furniture manufacturing, markets, management, etc.
- Design a method to retain/log 'lessons learned' in the company as labour turns over. The process should be evolving and form a manufacturing manual.
- Implement a training program and extension strategy for finishing and basic woodworking.

Reference

Lavoie, P.J.P., D. Fell and F. Laytner. 2006. Roadmap for the Canadian Value-added Industry. Prepared by Forintek Canada Corp. for Natural Resources Canada - Canadian Forest Service. 179 pp.

Value to Wood Research Program Partners

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