

# Reconstituted Veneer

## Commercial Opportunities for Alberta Producers BUSINESS CASE

Prepared for Alberta Finance and Enterprise (AFE)

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### 1. What Is Reconstituted Veneer?

Reconstituted veneer is real wood that has been rotary cut, sorted and dried. Dyed glues are injected between each of the veneers. Layers of veneer are pressed into thick rectangular blocks (usually 24" by 24'). These 'billets' subsequently are sliced (Chart 1) using varying types of slicing approaches. The resulting product is a homogeneous and consistent pattern that looks very like natural 'clear' veneers that typically are found otherwise only in very high quality sliced veneers, or as the 'face' in high quality plywood. Reconstituted veneers vary in thickness, and increasingly are produced in thicknesses close to 1/100" compared with traditional thicknesses of 1/32" to 1/42". Some are paper or plastic backed to enhance flexibility in application, and also as edge-band materials.

The economic rationale for reconstituted veneers is that they offer a high quality real wood 'look-alike' of increasingly scarce highly-prized natural wood veneers. Moreover, they are highly consistent in grain patterns, and are used widely where appearance and quality of finish are paramount. They are produced by various manufacturers in Europe (notably, high quality producer Heitz Furnierkantenwerk: Chart 2), China (e.g. Vicwood), Australia (e.g. Briggs) and North America(e.g. Formwood Industries).

Chart 1

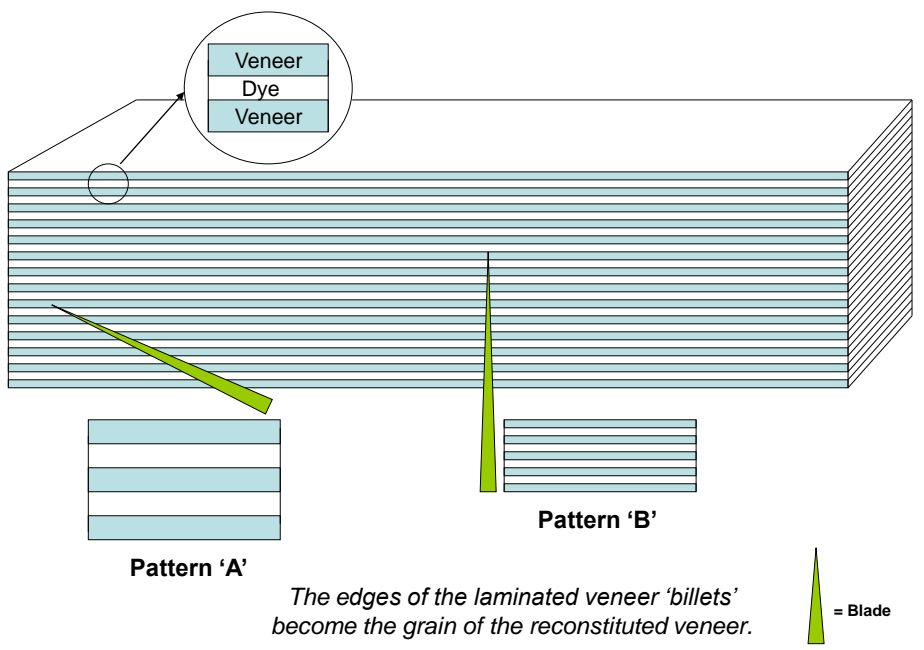


High Quality Real Wood Edge-Banding and Reconstituted Veneers Produced by Heitz Furnierkantenwerk

Website: [http://www.h-heitz.de/index.php?lang=2&nav\\_id=18&sub\\_id=11](http://www.h-heitz.de/index.php?lang=2&nav_id=18&sub_id=11)

Chart 2

#### Reconstituted Veneer 'Billet' Showing Alternative Knife Cutting Patterns



The edges of the laminated veneer 'billets' become the grain of the reconstituted veneer.

= Blade

# 1. What Is Reconstituted Veneer?

## High-End Applications

As noted later, the manufacturing of reconstituted veneers is a complex process and is not inexpensive. On the other hand, the resulting product aims at a high price point – namely consistent veneer patterns using real wood.

When purchasing shipments of natural veneers, buyers often report that these consignments are highly variable, containing only a small proportion of 'A' veneers and large volumes of intermediate and lower grades.

Contact Industries ([www.contactind.com](http://www.contactind.com)) is among the world's leading providers of high quality construction projects using natural woods. It use reconstituted veneers in some high-end use applications.

Chart 3 illustrates some of its designs and finished projects. Appearance is paramount. But Contact Industries also selects its wood for strength in some applications – often requiring structural core material and high grade appearance grade surfaces.

Thus, it may combine a Douglas fir LVL with a pine veneer to achieve a combination of desired attributes. Firms such as these would be important reference points regarding wood attribute requirements for aspen/polar reconstituted veneers to be produced in Alberta.

## Reconstituted Veneers



Flat Laminates: Upscale Florida Resort



D. Fir LVL with Pine Veneer: Falcon Wharf London

Source: <http://continuingeducation.construction.com> (Photos courtesy of Contact Industries [www.contactind.com](http://www.contactind.com))

# 1. What Is Reconstituted Veneer?

## Cost Trends

The Hardwood Plywood and Veneer Association (HPVA) notes that "U.S. hardwood veneers are expected to steadily increase in price while they decrease in quality. It concludes that declining average quality of domestic veneers increasingly will create "veneer yield" issues – in the sense of declining recoveries of high grade material. Less and less volume of high grade 'AA face' veneers will be available, forcing markets to use lower grades as well as alternatives including reconstituted veneers. Non-wood laminates also have significant potential growth, and are produced in high quality grades, especially since the advent of high pressure laminates.

Declining availability of tropical hardwoods, from many traditional supply regions including West Africa, Indonesia and South America, has many drivers. Regulations that force a decline in logging activity, along with measures to reduce illegal logging, and increased certification of forest management sustainability, each contribute to reduced increments of supply and sharply higher price trends for natural wood veneers.

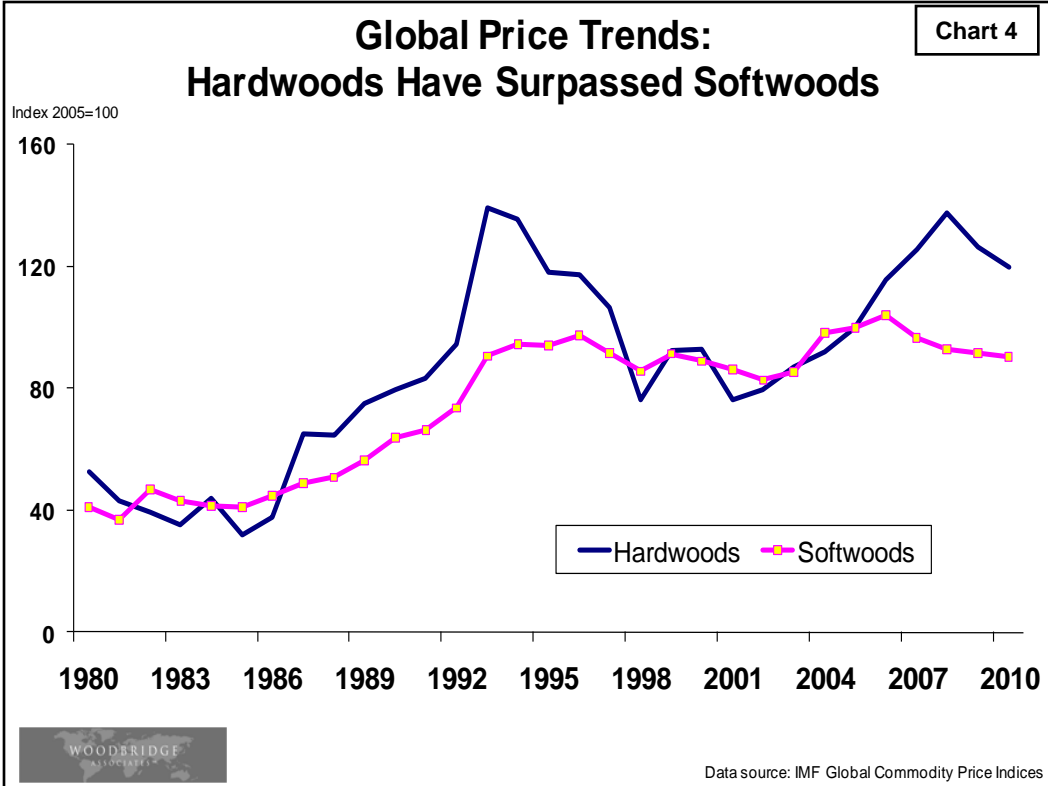
There are some suppliers who offer plantation grown veneers (e.g. Formwood, Indonesia). But, generally, the most highly prized natural veneers are obtained from previously un-harvested natural forests.

Overall, the price trend in hardwoods have surpassed those for softwoods (Chart 4). Data in the chart are shown on a price index basis. Most notably, during peak market activity, hardwood prices tend to spike well above those on average for softwoods. Rising prices, as well as the declining availability of high grade natural veneers, are forcing buyers to seek alternatives, such as reconstituted veneers.

With A-grade veneers representing less than 3% of the outturn of most North American hardwood veneers, the supply situation has become more acute. There are some quality issues regarding reconstituted veneers (e.g. discoloration in exposure to sunlight: see later section 'Business Case: Follow-Up').

Even so, it is an increasingly attractive natural fibre solution to the world's declining supplies of high grade tropical hardwood logs – and a 'green' alternative to melamine and petro-chemical based compounds.

Various projections indicate that, although a global shortage of timber is not an immediate prospect, declining supplies from traditional sources (notably indigenous forests) and rising demand, are creating shortages of higher grade peelable logs. This trend is expected to continue.





### 2. Why is it Being Considered for Investment in Alberta?

The Government of Alberta \*\*\* ('GoA') has identified a potential opportunity for reconstituted veneers to be produced in Alberta. If a prima facie business case can be made for this product, it would be considered as a candidate for investment attraction.

One of the key factors driving the interest of the GoA is the observation that aspen-poplar grows extensively within Alberta. While much of this timber resource already is allocated to existing licensees under various forms of tenure, it is viewed that there may be incremental supplies of this species group available potentially from two categories of sources. Firstly, incremental supplies of existing aspen-poplar from unallocated forestlands. Secondly, given the potential to achieve productivity gains on Alberta's private and Crown forestlands, the potential exists for higher timber yields from hybrid poplars. The latter would be similar to several current plantation areas (e.g. Daishowa-Marubeni International).

In this respect, the reconstituted veneers manufacturing potential identified by the GoA can be regarded as a 'resource-driven opportunity'. Moreover, this is attractive to the GoA because the product has high market value per unit volume, and because of its potentially high return to fibre.

#### The Aspen-Poplar Resource in Alberta

Most of northern Alberta is covered with a Boreal mixed-wood forest in which white spruce and two poplar species (aspen and balsam poplar) predominate.

Chart 5 (Thomas) indicates the range of aspen growing naturally across Canada, and indicates the location of fast-growing hybrid poplar programs.

Thomas estimates that there are 28 million hectares of poplar ('Populus') growing stock in Canada, comprising trembling aspen, bigtooth aspen, plains cottonwood, black cottonwoods, narrowleaf cottonwood and naturally occurring hybrids.

Alberta's naturally occurring aspen resources already are well developed commercially. This process began in the 1980s, and resulted in major investments in aspen market pulp production. Generally, the province's wood products industry is not a major user of the aspen resource at the present time, although it is used for a variety of processed wood products including wood pallets and specialty grades of aspen lumber.

Chart 5



#2998-000-9

Source: 'Poplar and Aspen Breeding in Canada' Barb Thomas Genstat Consulting. Available on Poplar Council of Canada website [www.poplar.ca](http://www.poplar.ca)

**2. Why is it Being Considered for Investment in Alberta?**

**The Aspen-Poplar Resource in Alberta (continued)**

Deciduous timber species, predominantly aspen-poplar, represent around 41% of Alberta's allowable annual cut ('AAC'). This is a volume of around 11.2 million m3 per year. The harvested volumes typically remains below the AAC because of factors such as market cycles. Chart 6 shows that in 2006 and 2007, the province's deciduous harvested volume was 9.6 million m3 and 8.4 million m3 respectively. Much of this is in mixed stands (requiring harvesting also of SPF logs) but many areas contain dense but small stands purely of aspen (Chart 7).

In addition to already allocated volumes and area-based tenures, extensive supplies of aspen-poplar for a *greenfield fully-integrated* reconstituted veneer facility could be available from public lands and private timberlands (including farms).

On Crown (public) lands, licenses to harvest these incremental volumes would be at the discretion of Alberta Sustainable Resource Development ([www.srd.alberta.ca](http://www.srd.alberta.ca)).

If a *non-integrated* reconstituted veneer facility is contemplated, it would have to obtain a dependable supply of veneers, or veneer blocks, from existing wood product facilities (i.e. plywood /veneer producers) .



**Chart 7**

Aspen Stand in Winter: Photo Jim Witiw. Daishowa Marubeni International Ltd. From Poplar Council of Canada Newsletter (Dec 2006)

#2998-000-8

Annual Allowable Cut <sup>1</sup>		Coniferous (m <sup>3</sup> )	Deciduous (m <sup>3</sup> )
Forest Management Agreements		11,049,000	7,544,000
Quota / Deciduous Timber Allocation		4,457,000	3,118,000
Other		471,000	551,000
Total		15,977,000	11,213,000
Total Coniferous and Deciduous		27,190,000	

Harvested Volume <sup>1</sup>	2006		2007	
	Coniferous (m <sup>3</sup> )	Deciduous (m <sup>3</sup> )	Coniferous (m <sup>3</sup> )	Deciduous (m <sup>3</sup> )
Forest Management Agreements	9,892,000	4,949,000	9,749,000	4,647,000
Quota / Deciduous Timber Allocation	5,450,000	2,934,000	4,000,000	1,751,000
Other	171,000	1,721,000	885,000	1,955,000
Total	15,513,000	9,604,000	14,634,000	8,353,000
Total Coniferous and Deciduous	25,117,000		22,987,000	

<sup>1</sup> Alberta Sustainable Resource Development





### 3. Existing Supplies of Domestic Veneers

#### A Well Developed Wood Products Industry, but Limited Production of Wood Veneers

Alberta has a well developed wood products industry, with aggregate sales typically well in excess of \$2.5 Billion annually (2005 data, SRD). The primary wood products sector in the province employed over 31,000 persons during the most recent market peak in 2005. Most likely only temporarily, this has declined to around 24,000 persons during the current global recession. Panelboard sales, including veneer production, correspondingly have experienced a decline in annual sales in recent years. But, at the recent market cycle peak, they were around \$1.4 Billion.

Though it has a well developed primary industry, Alberta's production of veneers is large scale, but limited in aggregate volume. Moreover, it is focused on the production of softwood veneers (see Alberta Plywood, Chart 8) for structural panels (plywood).

At the Alberta Plywood veneer mill in Slave Lake, veneers are produced and are shipped to the Company's Edmonton plant for lay-up and production of plywood. The species group is SPF, with a heavy focus on spruce.

Throughout Alberta, aspen-poplar veneers are not produced on a commercial scale, even though the potential to do so exists. In other provinces (e.g. Ontario) similar resources of aspen-poplar are rotary peeled and used either as a substrate for decorative panels (e.g. Norbord-Kruger 'True-North' joint venture at Cochrane, ON) or are used for construction grade plywood.

#### Fibre Supply Analysis

Our fibre supply analysis concludes that development of a reconstituted veneer facility conceptually would not be constrained by the quality or volume of the province's aspen-poplar fibre supply, nor its cost-competitiveness in terms of wood costs.

However, there are very limited supplies available at present of suitable hardwood veneers that a new plant could anticipate buying. In addition, there are only small scattered volumes of high density, higher valued domestic hardwoods (e.g. western maples). So we conclude that an *integrated greenfield reconstituted veneer facility* would have to be considered.



Chart 8

Veneer Produced at Alberta Plywood, Slave Lake

Photo: Specialty Wood Journal Sept/Oct 2005



4. Market Potential: Overview

Market Identification

The Canadian Market

Two potential major geographical markets exist for reconstituted veneers, if they were to be produced in Alberta. The smaller market is in Canada. Sales to this domestic market would have several advantages over export market sales including, for example, avoiding the variability in earnings that can result from currency fluctuations. However, because of the existence of a well-developed hardwood veneer and plywood industry in central and eastern Canada, we believe the ability of an Alberta-located facility of this type to penetrate eastern markets – and be financially successful – would be constrained.

On a smaller scale, Alberta has some well-developed potential end-users of reconstituted veneers – notably its well developed kitchen cabinet, doors and wood furniture industry. An example of this is Denca Cabinets. This is a high quality European-style cabinet manufacturer that has been established in Calgary since 1977, which uses decorative veneers extensively in its products.

Chart 9 shows an example of then potential. In this picture, Denca has book-matched Australian Walnut and Tamo custom veneer to develop a very attractive modern kitchen. For this design, Denca won the '2009 Best in Show' award at the Calgary Home and Garden Show.

There are several other leading edge producers of value-added wood products in Alberta, among whom demand for reconstituted veneers likely is quite high. In order to achieve adequate economies of scale, however, we believe that an export focused reconstituted veneer facility located in Alberta would have to be consider also exporting to the U.S. market.

Moreover, in order to be competitive, and offer the same range of reconstituted veneers currently provided to the marketplace, an Alberta-based reconstituted veneers manufacturer also would have to consider importing highly attractive wood veneers from abroad. Otherwise, aspen-poplar alone (even with dyes, it has a limited grain pattern) would have only a narrow market following.

The Canadian Green Market

One of the potential consumer-market advantages of a range of Alberta produced reconstituted veneers (i.e. including various aspen-poplar grades) is that they would appeal to the domestic 'green' market. This is because the vast majority of Alberta's commercial forests are independently certified as being managed under principles of sustainability. Increasingly, however, many imported reconstituted veneer sources also are able to certify their products in the same way.



**5. Market Potential: U.S. Dependence on Imported High Grade Veneers**

**U.S. Market Potential**

The United States is a potentially significant market for aspen-poplar reconstituted veneers produced at an Alberta location. The U.S. imports over \$300 million of hardwood veneers in a typical year (Chart 10). Even though bold patterns of tropical species of veneers are very high profile within the North American cabinets and furniture industry, in fact about half of what the U.S. imports comes from Canada.

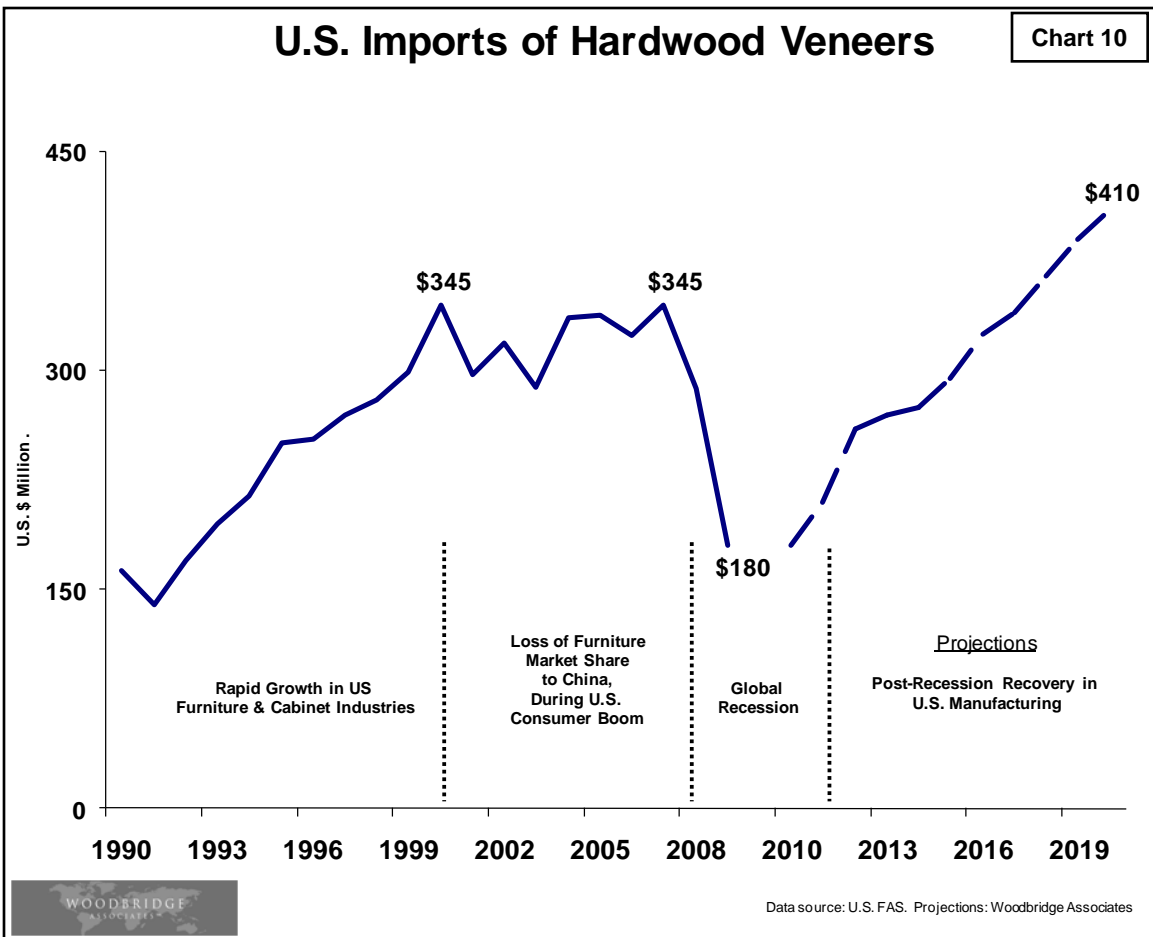
Imports from Canada are mostly from eastern Canada and comprise predominantly higher density high value hardwood species (e.g. Canadian maples). But part also comprises lower density veneers – including aspen/poplar.

The Chart shows that U.S. imports of hardwood veneers from all countries declined sharply with the onset of the global economic recession in 2007. Earlier data in the chart show some important trends. During the 1990s, there was rapid growth in the furniture industries of the U.S. and Canada. This peaked in the 2000s, as more furniture plants were re-located to Asia, notably China (and more recently Vietnam).

The North American kitchen and bathroom cabinet industry, however, remained strong and did not experience the loss of market share to Asia that impacted the wood furniture sector. Thus, although there was a loss of veneer markets in furniture, there was substantial growth in veneer demand in high end cabinets. Overall demand for imported veneers in the U.S. flattened but did not decline.

It also is worth noting that, alongside the sharp decline in wood furniture manufacturing in states such as North Carolina, a large part of the U.S. supporting capacity in hardwood veneer and plywood manufacturing also has been closed permanently over the past decade. Imports of hardwood plywood (not shown in the chart) increased dramatically during the U.S. consumer boom years. Much of this volume was from China, as well as from Finland (birch), Russia (birch) and elsewhere.

The economics of harvesting hardwoods from U.S. eastern timberlands have shifted over the past decade, with an overall decline in U.S. output, and a greater dependency on imports.



**5. Market Potential: U.S. Dependence on Imported High Grade Veneers**

Among the hardwood veneer and plywood species imported by the United States, maple (Canada: Chart 12); birch (Russia, Finland and China: Charts 11 and 13) and Okoume (West Africa: Chart 14) are purchased in significant volumes.

The supply chain in North America comprises the importer (e.g. Penrod, Chart 14) as well as a system of regional and local distributors. Many buyers purchase comparatively small volumes, while others (notably door manufacturers) use large volumes and may deal directly with the importer.

The North American distribution system provides a useful service, in terms of carrying a wide inventory of varied species and sources. Overall, however, this adds significantly to the final delivered cost.

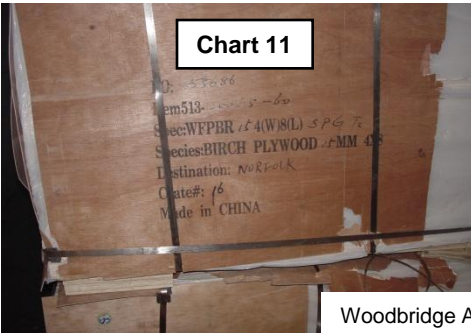


Chart 11

Woodbridge Associates photos



Chart 12



Chart 13

Woodbridge Associates photo

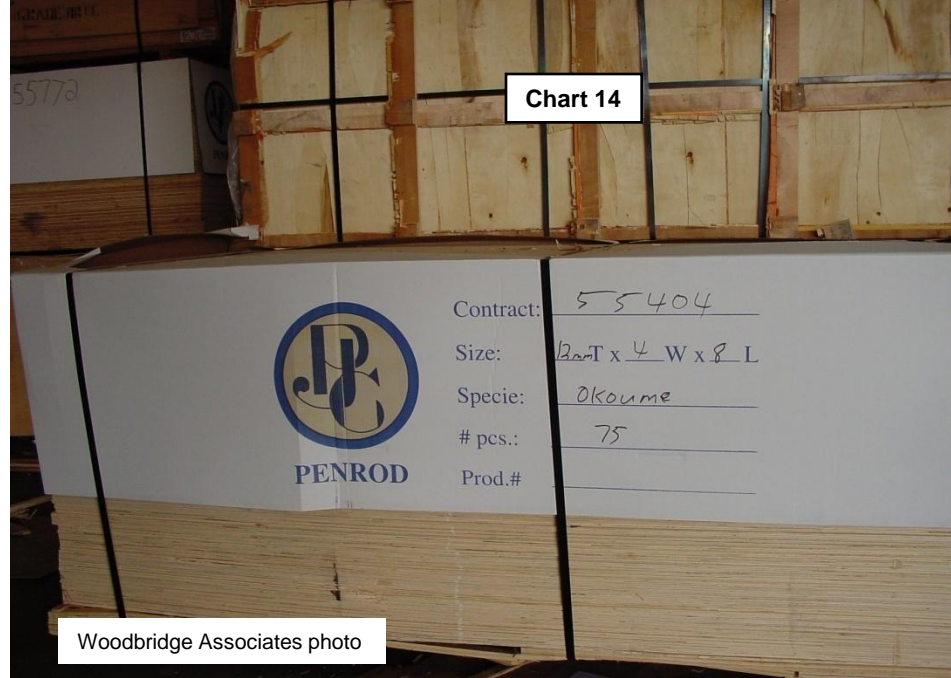


Chart 14

Woodbridge Associates photo



### 6. Market Segments: Product Strategy for an Alberta Producer

#### #1. Traditional Competitive Advantages Become Blurred

Years ago, most hardwood veneers in North America were produced close to where the trees grew. Thus, a sizeable high density hardwood veneer and plywood industry evolved in areas, such as eastern Canada and eastern United States where species such as maple, cherry, oak and walnut occurred. These regions also developed extensive furniture industries.

Much has changed in recent decades. Traditional competitive advantages such as these have become far less important with the emergence of (a) high quality reconstituted panelboards (e.g. MDF) and a wide variety of laminate (Chart 15) and veneer materials and (b) lower cost – but high quality – producing regions (e.g. China). Several of the major casegood industries, such as cabinet manufacturing, have become located close to markets – and use a variety of material combinations (Chart 16) some of which are imported, and others are domestic supply.

Chart 16



Chart 15



Woodbridge Associates photo: courtesy of Euro-Rite

Woodbridge Associates photo: courtesy of Euro-Rite



**6. Market Segments: Product Strategy for an Alberta Producer**

**#2. Future Industry Re-Structuring Still Evolving**

Another consideration for a potential producer of reconstituted veneers based on the aspen/poplar resources of Alberta is that, having lost so much market share to China and Vietnam, the North American furniture industry is only just becoming restabilized. Numerous jobs have been lost (Chart 17) but many small shops (Chart 18) have survived as niche providers. Importantly, around 25% of all Canadian hardwood veneers and plywoods shipped to the U.S. go to western states (Chart 19).



**Alberta is Well Located to U.S. Markets**



**6. Market Segments: Product Strategy for an Alberta Producer**

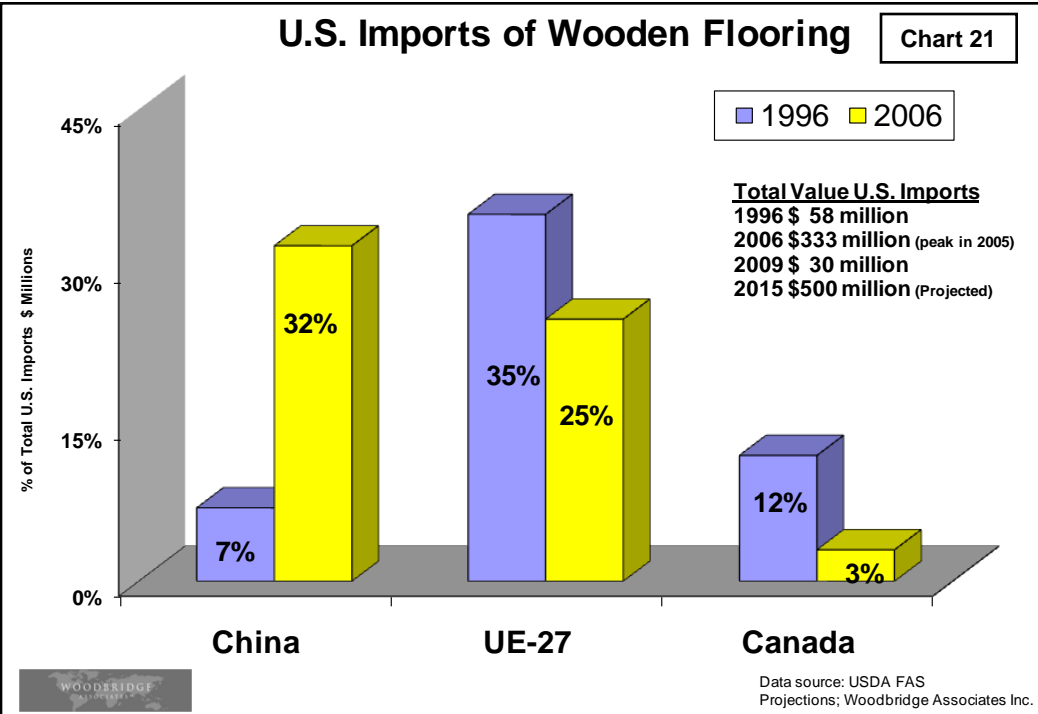
**#3. Alberta Should Focus on Strong Recovery Sectors and 'Green' Markets**

Much further work would need to be done on the financial viability of the concept. Our preliminary analysis of the most appropriate product-market strategy for a prospective manufacturer of reconstituted veneers located in Alberta (none exist today) and based on the province's aspen/poplar resources, is as follows:

**High Priority Markets**

- Green Building Product Markets** – leveraging the competitive advantage of Alberta's independently certified sustainable forest management practices.
- High Recovery Markets (2011-2015)**. These we believe will include (1) The kitchen and bathroom cabinets industry (Chart 20) spurred by buoyant home upgrading expenditures and (2) the wood flooring industry. The latter would seek to capture market share based on the consumer trend away from carpeting to more healthy wood floors. Both of these end-uses potentially could utilize aspen/poplar, and the economies of scale would be sufficiently large to justify consideration of a state-of-the art plant.

As noted earlier, we believe that the U.S. market also would be important to an Alberta based manufacturer. Chart 21 shows that, although China has surpassed the EU as a major supplier, a significant recovery in U.S. demand for wood flooring is expected. Alberta produced wood flooring made, for example, from thin-MDF-backed reconstituted aspen/poplar veneers is a potential product for this market.



**7. Business Case: Follow-Up**

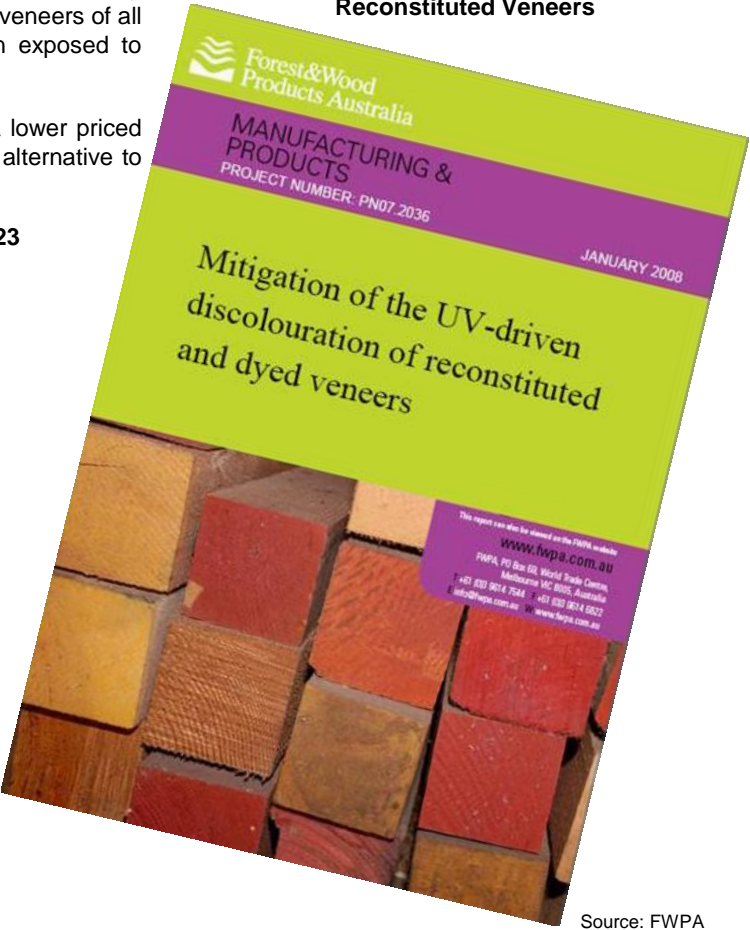
**Technical Attributes of Alberta Aspen-Poplar**

Limited data is available on the technical characteristics of Alberta's aspen-poplar with regard to their potential suitability as feedstock for reconstituted veneers. Generally, it is known that – as comparatively low density hardwoods – aspen/poplars act similarly to softwoods in woodworking. Some woodworkers say they have a 'fuzzy' surface which may not lend itself, without further surface treatment, to high grade finishes. In addition, regarding reconstituted veneers of all species, work in Australia (Chart 22) indicates that issues such as color discoloration of dyes (when exposed to sunlight) may also need to be researched at the technical level.

Overall, however, aspen/poplars are believed to lend themselves well to initial coloration and dyes. As a lower priced domestic hardwood, aspen/poplar could have significant potential for use in reconstituted veneers as an alternative to the five major hardwood veneers currently produced in the U.S. (Chart 23).

Chart 22

**Further Research Needed to Determine 'Dye Color-Fastness' of Alberta Aspen-Poplar in Reconstituted Veneers**

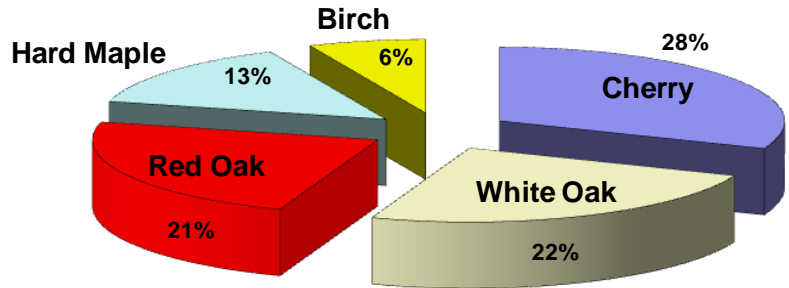


Source: FWPA

**U.S. Hardwood Veneer Production**

Chart 23

*Five Domestic Hardwood Species Make Up 90% of U.S. Hardwood Veneer Production*



*Species, such as alder, readily 'mimic' the characteristics of more expensive domestic species and 'exotic' imports. Technical testing of aspen/polar is needed to verify the potential of this species group to displace increasingly scarce domestic hardwoods.*

Data Source: HPVA



For Further Information Regarding the Potential Investment Opportunity  
Presented in this Report, Please Contact:

Alberta Finance and Enterprise

*Contact Details to be Added*