The Wood Products Industry in British Columbia.

The Next Twenty Years

Discussion Paper

CANADA–BRITISH COLUMBIA PARTNERSHIP AGREEMENT ON FOREST RESOURCE DEVELOPMENT: FRDA II

Canada

BC

The Wood Products Industry in British Columbia.

The Next Twenty Years

by
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This study was prepared under the direction of the Working Group to the Opportunity Identification program of the Canada-British Columbia Partnership Agreement on Forest Resource Development: FRDA II. The Working Group members are:

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SIMONS

The Wood Products Sector in British Columbia

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Highlights

- World industrial roundwood supply is predicted to increase at 1.4%/year for the next 20 years.
- Although global timber supply will increase, regional deficiencies will exist.
- North America will experience a small increase in softwood fibre production. Southern regions will substantially increase their production as plantation forests mature.
- Recycled fibres and technology will help reduce the constraints on the global land base.
- Global demand for softwood sawnwood will increase slower than growth in long term global GNP. In contrast, demand for composite wood panels and engineered wood products will be strong.
- In the 'Vision 2010' scenario, increased silviculture efforts and improved utilization will sustain a 90 million m^3 harvest from 30 million hectares.
- Market opportunities for the British Columbia industry are substantial.
- Producers will get closer to the consumer by shortening the distribution chain.
- The Interior wood products industry, on average, is very competitive serving the large commodity markets.
- The strong demand for high quality housing components, doors, windows and millwork represent an excellent opportunity for the Coast wood products industry which has already started to emphasize quality and grade.
- British Columbia has many competitive advantages in the production of composite products – low energy costs, proximity to the growing markets of Asia and an abundant supply of unutilised residual fibre.
- Declining timber supply, rising wood costs, and a poor public image could become significant constraints to growth. If overcome, a healthy and competitive forest industry can contribute significant wealth to the province through increased employment and income.

Introduction

Worldwide, the forest products industry is striving hard to compete in today's rapidly changing economy. At the same time, the marketplace and forest resources are undergoing dynamic transformations. Strategies for dealing with this unstable environment range from securing timber to establishing manufacturing and marketing operations abroad.

As these changes occur, the wood products industry in British Columbia will face both opportunities and constraints. Its ability to capitalize on growth potential and mitigate barriers will depend on how all stakeholders – the public, industry, government and labour – work together for the future.

This paper provides an outlook for the wood products industry in British Columbia to the year 2010. It also explores the industry's competitiveness in the context of global wood product demand and timber supply trends. Finally, two scenarios are analyzed to evaluate their implications to the forest industry and the province. The first assumes a fibre constrained harvest of 65 million m³/year by 2010, (60 million AAC plus 5 million private) resulting from a continued decline in annual cut. The second, more optimistic, but attainable scenario is based on all stakeholders adopting an agreed strategic direction resulting in 'Vision 2010'.

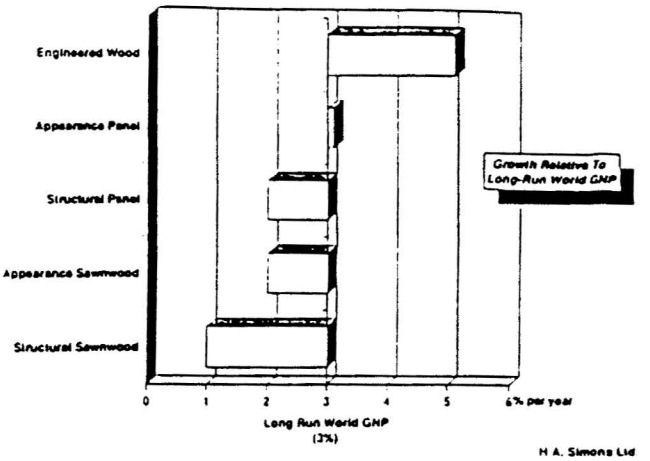
The information and analysis contained in this report are based on numerous sources. A key source of information is a survey conducted by H.A. Simons Ltd. of international forest products industry experts. The survey examined long run demand and emerging technological trends in both the solid wood and pulp and paper markets. Other studies conducted by H.A. Simons Ltd. are used, including a recent analysis of the outlook for the forest products industry to the year 2010, in addition to reports and papers prepared by other consultants and individual companies.

Global wood products demand trends

The worldwide demand outlook for wood products over the next 15 to 20 years varies substantially by product and region. The market for commodity products, especially structural sawnwood, will grow at rates much lower than long-run world economic growth which is projected at about 3.0 – 3.2%/year. On the other hand, higher valued products, such as engineered wood products and appearance panels, will outperform overall economic growth, (Figure 1).

Figure 1

World Demand For Wood Products
Annual Growth Rates
1990 - 2010



Demand growth for softwood sawnwood will be slow due to the dominance of mature markets and commodity grades

Softwood sawnwood is a mature product, particularly when used as a basic commodity for construction purposes. Since 1970, global demand has grown around 1%/year. H.A. Simons Ltd. projects that demand will continue to grow at the same rate for the next 2 decades.

In the coming 20 years, close to 50% of incremental softwood lumber consumption is expected to occur in the fast growing, developing regions of Southeast Asia and Latin America. Demand growth could reach 2.5%/year, which is still well below long run GDP/GNP growth in these regions. High grades of lumber show slightly better rates of increase.

In contrast to the developing regions, consumption of softwood lumber in North America and Europe is expected to grow at just over 0.5%/year. The volume growth is still substantive, however, because these two regions presently account for almost 60% of the world's consumption of softwood lumber.

Demand for composite wood panels will be strong in terms of market share and growth

The world outlook for panel products is very promising due to the growth in composite panels. The United Nations Food and Agricultural Organisation (FAO) recently (1991) predicted that the demand for wood based panels will increase by approximately

4%/year for the next 20 years. On this basis, current world consumption of 125 million m^3 would increase to 275 million m^3 by the year 2010.

This level is regarded as being overly optimistic. H.A. Simons Ltd. forecasts wood panel demand to reach 225 million m^3 by the year 2010, reflecting a growth rate of 2.9%/year.

On a product by product basis, substantial differences emerge. Plywood production and consumption will at best remain relatively static and could even decline, as substitute panels continue to erode market share. The principal plywood producers, Southeast Asia, Japan and North America, account for 85% of production. In many of these regions, the availability of timber suitable for plywood production is declining, limiting the volume produced.

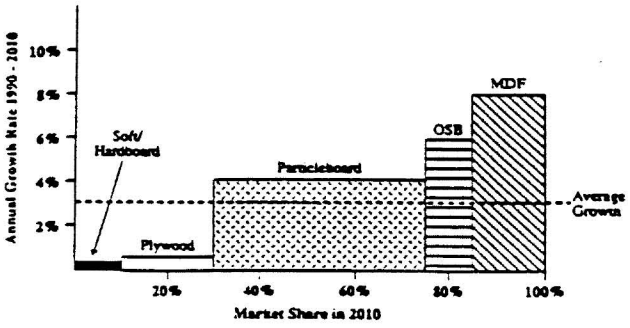
H.A. Simons Ltd. estimates composite products have the potential for healthy 4%/year growth over the next 15 to 20 years. 'Particleboard', which is defined by the FAO to include both particleboard and oriented strandboard (OSB), is forecast to grow at 4.5%/year over the 1990 – 2010 period. Historically, particleboard use has been growing at 6%/year (1970 – 1990).

Fibreboard, which includes hardboard, softboard and Medium Density Fibreboard (MDF), is forecast to grow marginally faster than particleboard at 4.7%/year, but substantially faster than its historical rate of 1%/year. This dramatic change from past levels is a result of the recent rapid acceptance of MDF in world markets. The demand for hardboard and softboard is in a general decline and all of the fibreboard growth will emerge from MDF. As a result, MDF is expected to achieve the greatest annual growth of all composite panel products.

Figure 2 summarizes the outlook for the consumption of panel products in terms of market share in 2010 and growth rates over the 1990 – 2010 period.

Figure 2

Global Demand For Wood Panels
Market Share & Growth Rates - 2010



H.A. Simons Ltd.

The relative importance of the individual panel products varies considerably by region. In Europe, plywood is of relatively minor significance at only 16% of panel consumption. In contrast, in the Asia Pacific and North America regions, plywood currently accounts for 75% and 55%, respectively. Plywood production has been higher in these regions because suitable roundwood was economically accessible. However, the availability of this resource is declining and costs are increasing. Consequently, consumers in these markets are already changing their consumption patterns and are finding that composite boards meet many of their needs.

Engineered wood products will experience the strongest market growth

On a global basis, the demand for engineered wood products is forecast to increase by 5%/year. The largest demand and production growth will occur in the developed countries. However, even in the developing regions, there will be an increasing market share for these products. The interest in engineered wood products has generally been sparked by the decreasing availability of high quality logs, rising wood and labour costs, and increasing market competition.

Opportunities exist for Laminated Veneer Lumber (LVL), and other engineered composite products, such as reconstituted 2x4s. These products could eventually end up replacing or complementing lumber. I-beams, stress-skin panel composites, and a variety of hybrid products using wood, metal and plastics will also be high growth products.

Some of these products already exist; others have been researched but await development; and many more need considerable research and development expenditure before they can become realities in the market.

Distribution chains shorten, consumers and producers get closer

As the demand for end-use oriented products grows, the relationship between the final consumer and the initial producer gets closer. Specific needs are being met by specific products. The need for the traditional multi-linked chain of distribution is diminishing. The position of the commodity wholesalers or futures brokers, who have significantly affected the market for lumber at times, is changing. Producers are getting closer to the consumer, serving as just-in-time suppliers.

Global fibre supply

Over the 1970 – 1990 period, the global supply of industrial roundwood grew at 1.4%/year, reaching 1.7 billion m^3 in 1990. Estimates by the FAO (1988, 1991) suggest that the world is capable of supplying 2.6 billion m^3 of industrial roundwood, while other estimates place the theoretical supply even higher. The FAO's supply forecasts are based largely on the current productive capability of the forest land base and forest management practices.

Industrial roundwood supply is predicted to increase at 1.4%/year to the year 2010

Other factors such as economics, politics, environmental pressures and social issues will impact the availability and demand for timber, and should be accounted for. Therefore, H.A. Simons Ltd. projects that the supply of industrial roundwood will continue to rise a rate of only 1.4%/year to the year 2010, versus the FAO's (1988, 1991) 2.2%/year forecast, (Figure 3).

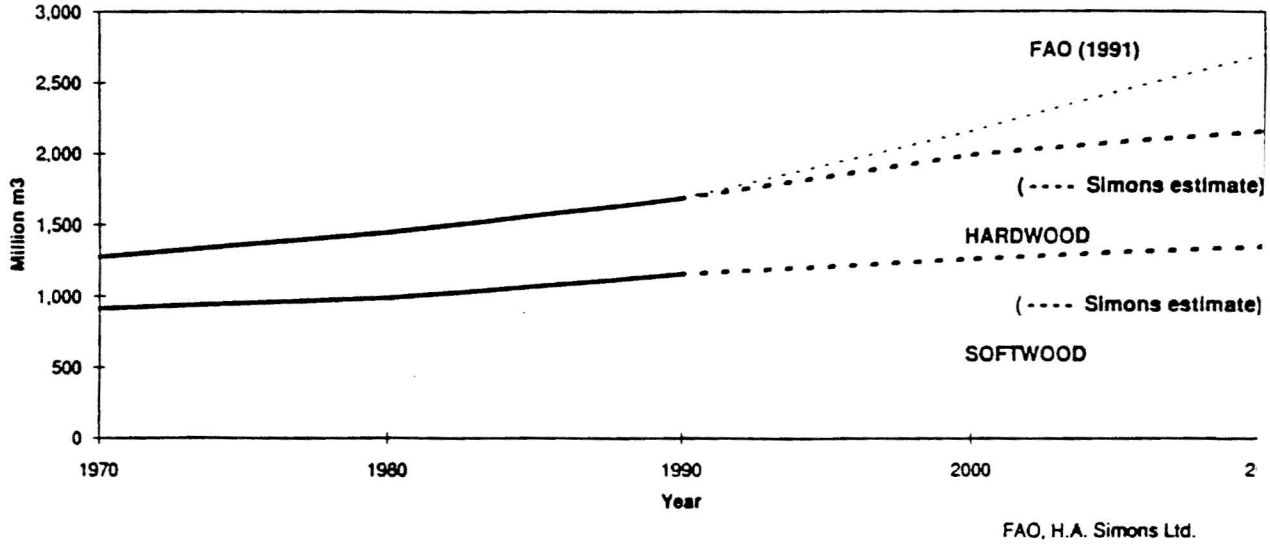
Shifts in industrial supply will occur in terms of species and geographic regions. Over the past several years, there has been a growing use of non-coniferous species for pulp, paper and wood products. Some hardwood species have performed extremely well on a price/quality basis in certain end-uses. Eucalyptus pulp in uncoated freesheet papers and aspen for OSB are good examples. Consumption and production of non-coniferous species has increased by 1.8%/year over the 1970–1990 period as compared to 1.2% for coniferous species. This trend will continue.

North America will realize little increase in softwood production, compared with tropical regions where fast growing plantations are maturing

The key sources of additional fibre between 1990 and 2010 will also shift. North America provided almost 50% of the softwood fibre increment between 1980–1990, but is likely to only supply 20% of the incremental growth between 1990 and 2010. Furthermore, some of this available fibre has already been committed to projects that have just started or are under construction (*e.g.* Alberta).

Figure 3

Global Industrial Roundwood Production By Species Group



FAO, H.A. Simons Ltd.

Supply increases in the US South are unlikely to offset the timber reductions in the US Pacific Northwest between 1990 – 2000. However, the US should experience positive timber supply growth after this period, partly due to incremental supply from the Northeast and Lakes States.

Timber growth exceeds removals in the Nordic regions but utilization of this surplus supply of timber will depend on its costs. In other parts of Europe, the additional timber supply is quite large, however the potential over the medium term is limited by factors like acid rain (Nilsson *et al*, 1992). H.A. Simons Ltd.'s assessment of the wood supply in the former Soviet Union indicates great potential for increased cutting capacity. However, economic, infrastructural, political and ecological constraints will prevent most of this supply from being fully utilized over the forecast period. Nevertheless, the timber supply that could be accessed is still significant.

Chile, New Zealand, South Africa and certain other regions will substantially increase their supply potential over the next 20 years, allowing the potential for expansion of domestic processing capacity. In many cases, because of intensive silvicultural treatments, these plantations will yield clear grade material suitable for higher end uses.

Timber supply is not constraining on a global basis, but regional deficiencies will exist

If the demand for industrial roundwood grows at the rate forecast by the FAO (1991), fibre constraints will emerge on a global basis. In some regions, real timber prices could rise sufficiently to encourage currently uneconomical timber to enter the supply picture.

However, based on the demand analysis conducted for this project, wood supply will not be a constraint on demand in the future. Regional constraints will occur, however, in parts of Europe, North America and possibly China, where consumption of forest products is expected to rise rapidly over the next ten years. Chile and New Zealand, where fast growing plantations will be maturing, will be exporters.

Recycled fibres and technology will eliminate some of the constraints on the global forest land base

The growing supply and use of recycled fibres from the urban forests will alleviate some of the demand pressures on the forest resource base. Wastepaper consumption has increased over 5%/year during the last ten years, with the strongest growth in Europe and Asia. It is estimated that there is sufficient supply of wastepaper to achieve similar growth rates over the next decade.

Finally, wood extending and saving technologies will also continue to emerge. Technologies such as finger-jointing, edge-gluing and laminating clear veneers provide the consumer with the product required, without demanding the high quality of raw material currently needed. Improved products such as I-beams have better strength characteristics and allow more economical structural design.

Competitive strengths and market outlook for the British Columbia industry

The wood products industry in British Columbia has distinguished itself as one of the most competitive players in the global forest products industry. The industry served the world's growing appetite for wood products over the last twenty years by having access to extensive tracts of undeveloped timberland, particularly in the Interior.

The Interior wood products industry is cost competitive

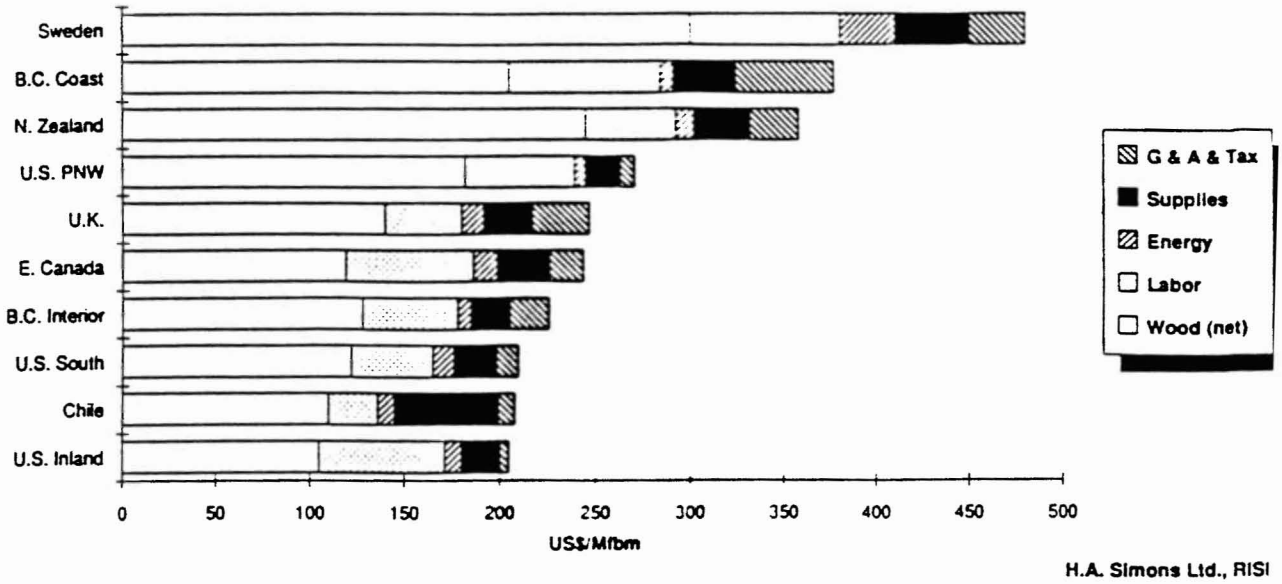
As competition grew, the industry in British Columbia responded positively and proactively. Interior producers, serving mainly the large commodity oriented North American market, underwent major structural changes. Industry concentration increased as did integration with the pulp and paper industry. Large 'supermills' appeared in the British Columbia Interior, accompanied by the demise of many smaller mills that were unable to compete. As a result, the sawmilling sector in the British Columbia Interior is well positioned from a cost point of view.

The coastal wood products industry has emphasized quality and grade

The Coastal industry has followed a different strategy than that used by the Interior industry. To offset rising log and labour costs, the industry not only improved productivity, but also produced less commodity grade products and more grade and quality products. The Coastal industry also shifted its focus from the US market to the higher valued offshore markets. Part of this change was driven by the rising Canadian dollar *vs.* the US dollar throughout the latter half of the 1980s, rising protectionism in the United States and growing competition in the supply of commodity lumber, including that from the Interior.

Figure 4

1991 Comparative Sawmilling Costs



H.A. Simons Ltd., RISI

Although the Coastal industry is a relatively high cost producer of softwood lumber, this disadvantage is being addressed by a focus on grade and quality (Figure 4).

The market opportunities for the industry in British Columbia are substantial

H.A. Simons Ltd. believes that the industry in British Columbia is well positioned for growth opportunities from a market and cost/quality aspect. Although the consumption of lumber, a mainstay product of the provincial wood products industry, is only expected to grow marginally in many of British Columbia's key markets, some of the competing supply sources in these markets are facing supply or cost challenges.

Lumber

A steady demand for commodity products exists and there is a strong group of high volume mills in British Columbia capable of aggressive competition in this sector. There is strong demand for lumber to manufacture doors, windows, mouldings and furniture. The high quality of much of British Columbia's forest resource allows for strong competition in producing these appearance grades. The industry has the opportunity to supply these consumers with specific components, precision cut and prepared for direct use.

The traditional approach, where a large cross section of lumber was sent to the market for processing into the final products is no longer appropriate if we are to be successful. Increasingly consumers in developed countries want to receive the final component ready for assembly. The wood products industry in British Columbia is already developing product programs to accommodate this trend.

Panels

As native tropical hardwood timber supplies tighten the Far East markets of Japan, South Korea and Taiwan offer great potential opportunities for British Columbia composite boards. Economic growth in these regions also promises to outperform that in North America and Europe. British Columbia is in an excellent position to serve these markets, both geographically and in terms of manufacturing costs. Many composite boards, particularly MDF, require a high energy input and British Columbia has favourable power costs. In addition, British Columbia has substantial volumes of currently unutilized fibre, mainly in the form of shavings and sawdust.

H.A. Simons Ltd. also believes that there will be opportunities for the remaining British Columbia plywood mills in both the US and offshore. These markets could emerge as US tariffs on plywood are removed and if the Japanese market opens up for softwood plywood.

Engineered products

The projected increase in demand for engineered wood products could provide a promising area of expansion. The industry is already producing the components required for the manufacture of I-beams, and the resource in British Columbia is suitable for the production of LVL. The surplus of wood residues is also important for producing composite engineered wood products.

The industry can be very competitive based on costs (*i.e.*, in the commodity markets) and quality (*i.e.* semi-commodity and specialty products). However, in addition to competing against other timber producing regions, the British Columbia industry faces a number of significant constraints to growth.

Constraints to growth

Declining timber supply, rising wood costs and a poor public image could become significant constraints to growth

One of the key constraining factors to the industry's future growth is timber availability. The industry in British Columbia was established on the basis of access to large volumes of good quality, relatively cost competitive timber. Now that harvest volumes are no longer increasing and as demand pressures on the forest land base are rising, this traditional competitive advantage is challenged.

At present, the allowable annual cut (AAC) on Crown land in British Columbia is about 73 million m^3. The sustainable supply from private lands is estimated at between 3 to 5 million m^3/year. In total, the current timber supply in British Columbia is 76 – 78 million m^3 which includes some deciduous and pulpwood quality timber.

The flow of fibre through the forest sector in British Columbia is shown in Figure 5. The volumes are based on the 1991 harvest level of about 74 million m^3. The lumber and pulp and paper sectors are the two dominant users of wood fibre.

Although this level of harvest is sustainable, assuming that the productive forest land base remains at about 30 million hectares (SPARK report, 1989), further reductions in the timber supply can be anticipated. The timber supply could be restricted to 65 million m^3/year by 2010 if the current trend in AAC

Figure 5
Current wood fibre flows in British Columbia
1991 Harvest levels

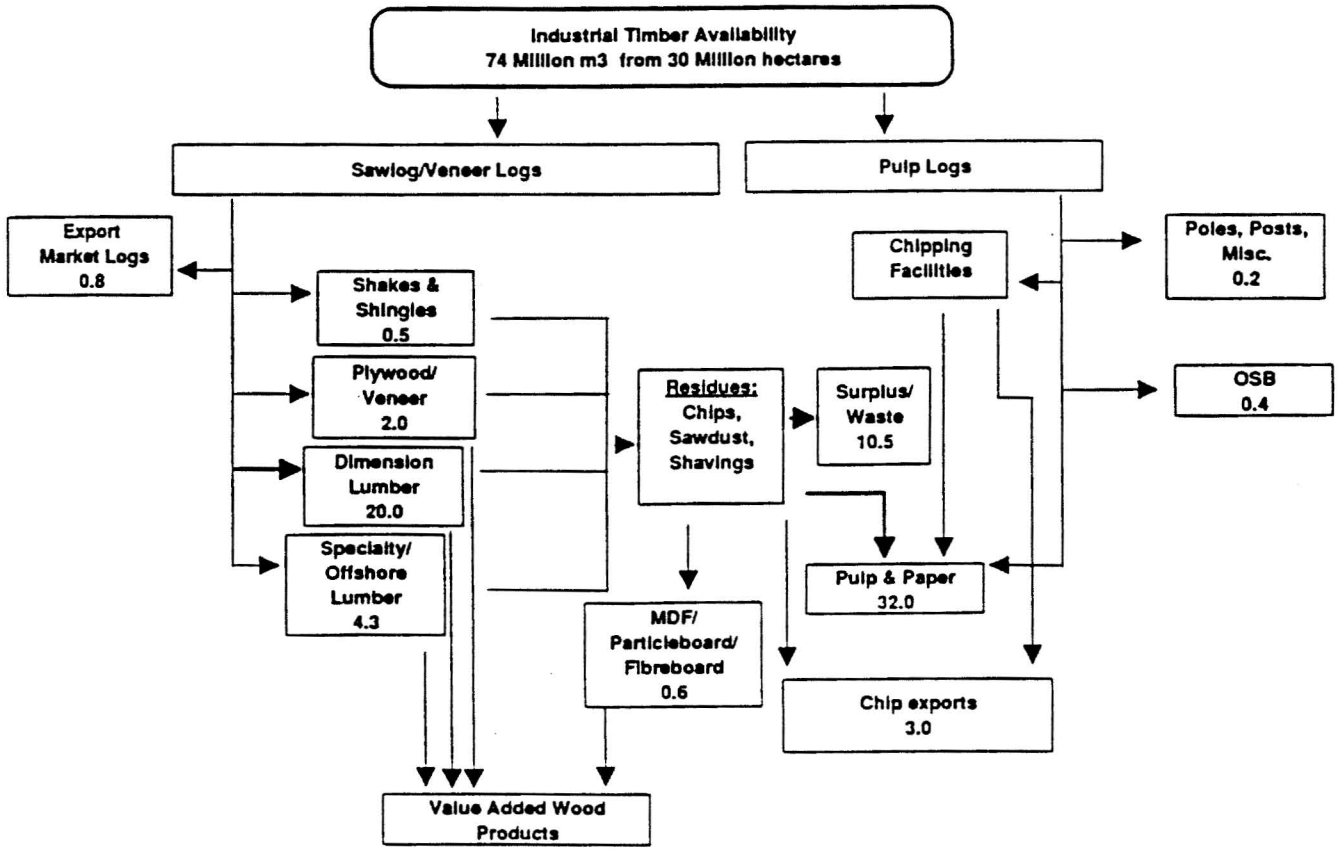
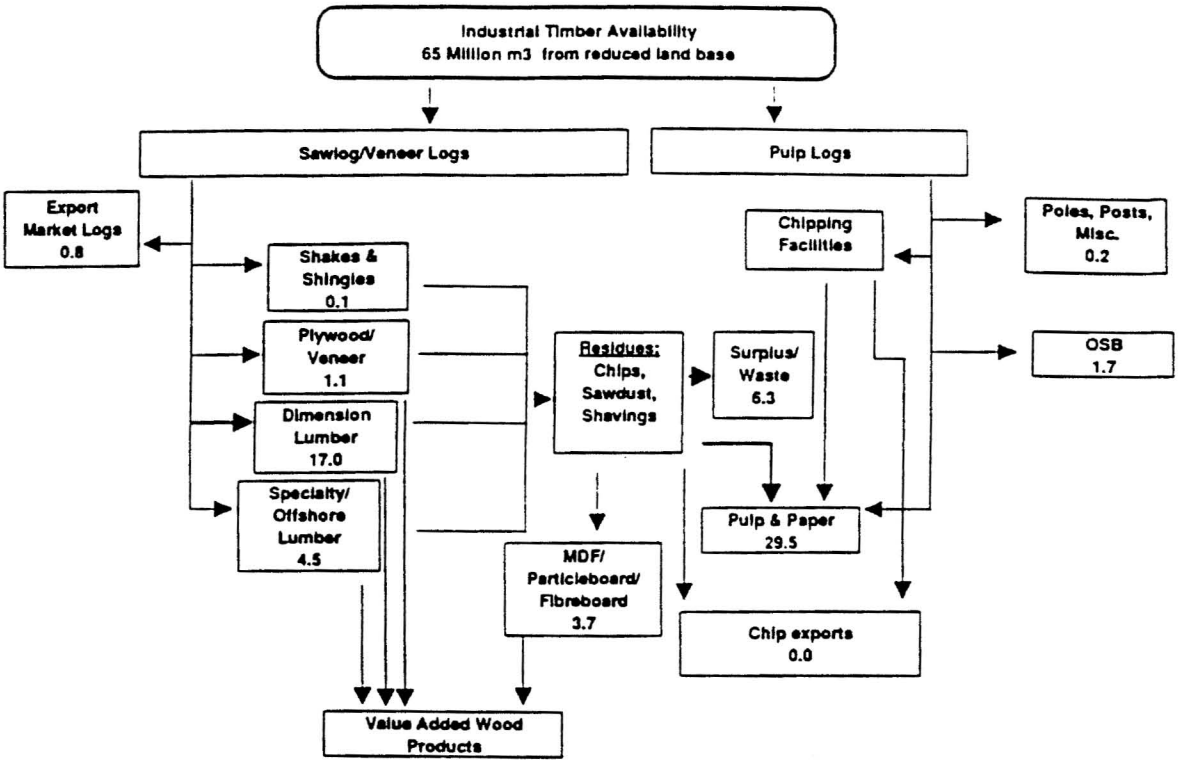


Figure 6
Wood fibre flows in British Columbia
Future base case scenario
(Based on AAC=60, Private=5)



reductions continues. The resulting fibre flow for this 'constraining' scenario is illustrated in Figure 6.

Rising log costs driven by both supply reductions and increased timber demands will affect profitability in the industry. Although the industry will still be able to compete in commodity grades, the reduction in profits will constrain necessary investments. Pulpwood and chip costs could also face upward pressures, affecting both the pulp and paper industry and the reconstituted board industry.

Forest productivity in British Columbia, particularly that of the interior forests, is among the lowest in the world. This places the industry at a competitive disadvantage when the area of productive forest land base is fixed or shrinking. Chile, for example, requires a forest area of between 110,000 to 140,000 hectares to supply the wood requirements of a 500,000 tonne/year pulp mill versus over 1 million hectares in the British Columbia Interior.

Finally, the current image of the industry does little to attract public and government support and scarce investment dollars. There is insufficient cooperation between the stakeholders and, as a resu most of the decisions made in British Columbia regarding the forest sector result in confrontations, rather than win/win solutions. This discourages investors and young, innovative people from enteri this industry.

The long term objective for the industry is clear. British Columbia needs a strong, healthy and world competitive forest industry. The markets offer a variety of opportunities and the industry has the potential to compete successfully. But the constrair must be overcome. This can only be achieved if all stakeholders develop and adopt a vision for the fut and agree on the strategic direction needed to mak this vision a reality.

Strategic Direction

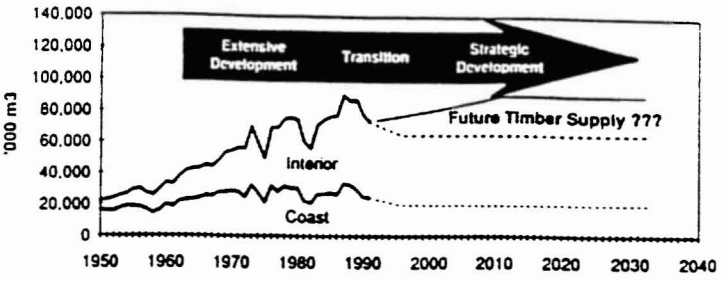
H.A. Simons Ltd. is convinced that the forest indu can achieve the above objective and that a joint 'Vision 2010' can be developed. The following poi outline some of the strategic directions that shoulc considered.

Improve the investment climate in British Columbia by first resolving the uncertainties surrounding many of the timber resource issues in the province. A land-use strategy, as articulated by the Forest Resource Commission and by the forest industry in British Columbia, must be developed. This strategy must address the area allocated to the working forest, tenure, integrated resource values and land claims.

Enhance the quality and quantity of the timber resource. Once a land-use strategy has been defined, quality and productivity improvements of the forest land base can be addressed. If British Columbia has 30 million hectares for commercial production, and increases the productivity of the forest base from 2.8 m^3/ha/year (SPARK report, 1989) using more strategically directed silviculture, the theoretical cutting level could be 90 million m^3/year (Figure 7). The increased harvest would be made up as follows:

AAC	- 75 million m^3
Opportunity wood, Close utilization and Commercial thinnings	- 10 million m^3
Private	- 5 million m^3
Total	**90 million m^3**

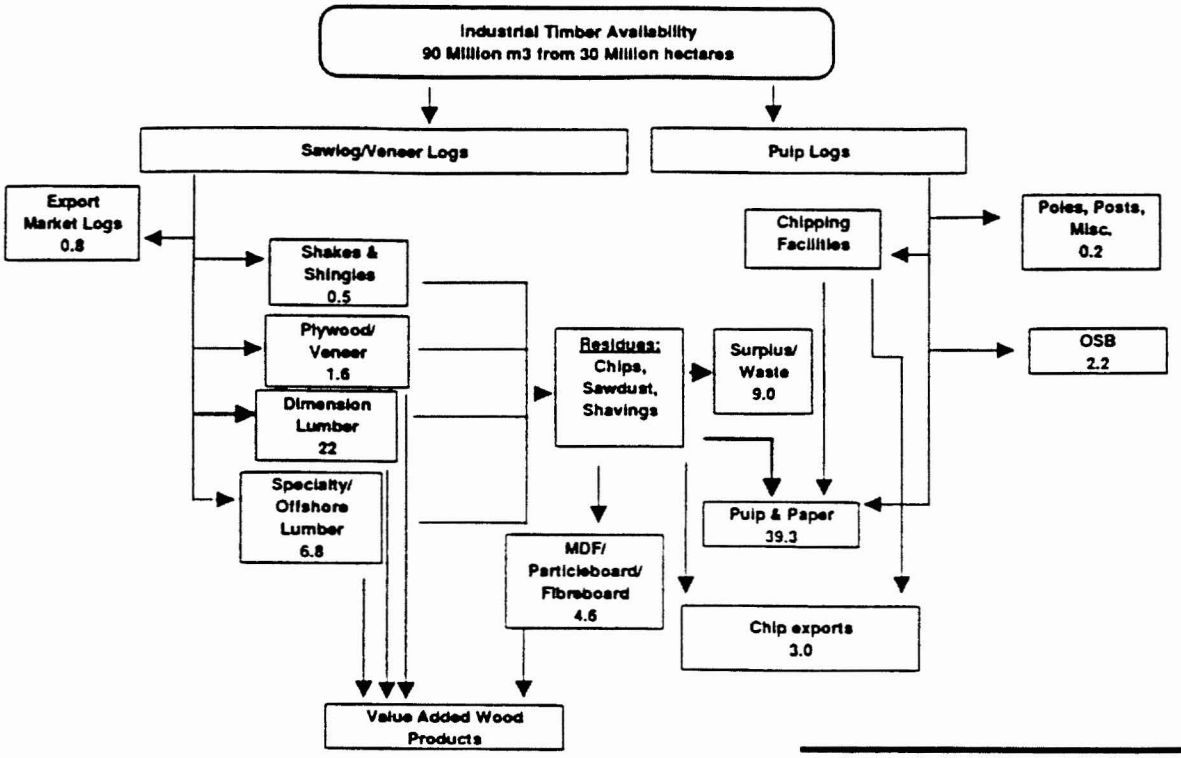
Figure 7
Timber Harvest In British Columbia



In addition, supply could come from hardwood and non-operable coniferous stands not in the AAC. Wood quality and future age class imbalances have to be examined, but the process must begin now. The fibre flow for this scenario, Vision 2010, is presented in Figure 8.

Optimize our existing strengths and assets. One of the industry's key competitive advantages, especially on the Coast, is the availability of substantial supplies of high quality old growth timber. High value grades and products can be extracted from this unique resource. British Columbia's low energy costs provide a competitive advantage in producing the composite products that have a high energy component.

Figure 8
Wood fibre flows in British Columbia
Future base case scenario
(Based on AAC=75, Other=10, Private=5)



Encourage and adopt a market, quality and innovation driven mentality. The industry has started the transition from a resource and production driven economy to one driven by the market, quality and innovation, (Figure 9). But the rate at which this occurs must be accelerated. At the resource base, more log merchandising will allow the industry to target resources, processing and products for specific market niches.

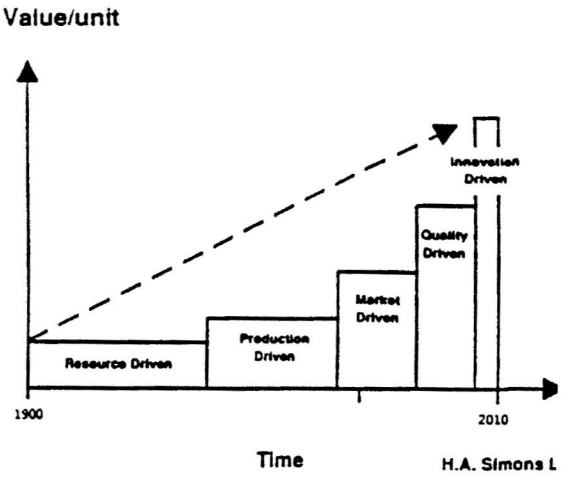
The industry is shifting its focus from commodity to higher value final products (Figure 10). The long term objective of the industry should be to minimize any further processing of British Columbia wood products once they have left the province. Some examples are:

- dried and shaped window components to the window manufacturer;
- laminated and overlaid posts to the Japanese home builder; and
- laminated and cut to size particleboard or MDF ready for assembly by the furniture or kitchen cabinet manufacturer.

Improve the continuity between industry segments, in part by developing strategic alliances. Functional integration between the resource growers and the final consumers should be developed. At the moment, that linkage is not well connected and consequently the optimum benefits of the resource and the assets are not being realized. Establishment of alliances throughout the chain,

Figure 9

Competitive strategy for the wood products industry in British Columbia



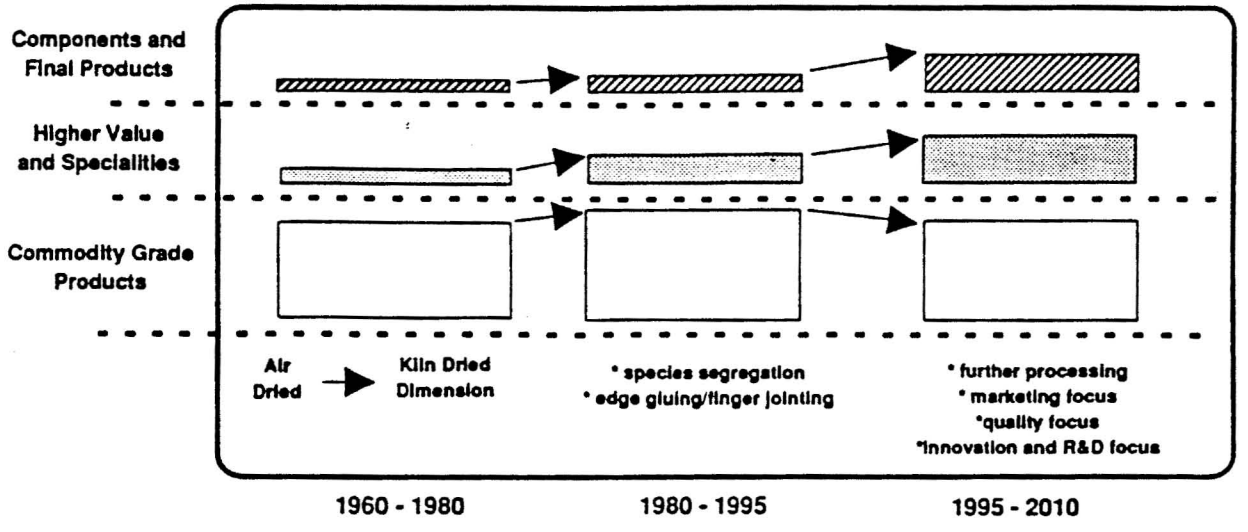
involving primary and secondary producers, distributors and the end user are essential. MacMillan Bloedel/Trus Joist and Ardew Forest Products/Misawa are just two examples of proactive strategic alliances.

The entrepreneurial strengths of the small compa nies need to be joined with capabilities of the majo companies – not by purchase and absorption but by developing a mutually beneficial cooperation.

New products and concepts can be developed through strategic alliances with other industries su

Figure 10

Progression of the wood products industry in British Columbia



as plastics, chemical and aluminum. The future for engineered wood products will include hybrid products. In addition, the high cost of R&D and human resource training can be shared by more than one company or industry.

Training, education and R&D. Finally, the objective of fostering a world competitive industry can only be achieved if there is access to new technologies and a skilled labour force. This requires intensified training and education of existing and future industry people. It also includes more emphasis on applied research. Research and development cannot be for the large players only. As will be seen below, small and mid-sized firms can be leaders in applied research.

Possible models

The above section has outlined a number of broad strategic directions needed if the province is to maintain its high standard of living through adopting 'Vision 2010'. Other industries and regions have developed successfully and can serve as models for the forest products industry in British Columbia. The two examples outlined below can provide valuable lessons for British Columbia.

The Swedish forest products industry went through a transition stage of development starting about 20 years ago. It resulted in cooperation at both the mill and government levels with increasingly large joint venture/strategic alliance companies emerging. These fully integrated groups can supply customers with virtually any product.

The market focus in Sweden starts in the forest where the resource is merchandised into many categories each designed for a specific processing facility and end product. The processing unit, in turn, is designed to convert that resource into products targeted for specific market segments.

Germany's small and mid-sized companies, known as the *Middelstand*, are another example of a sector driven by market, quality and innovation factors. These companies produce two thirds of Germany's GNP, generate 30% of the country's exports, train 9 out of every 10 apprentices and employ 4 out of every 5 workers. They use innovation and applied research to overcome some of the world's highest labour costs and a strong currency. They invest heavily in R&D and in many cases beat the larger players to the market with new products. They are very niche market focused and offset their large R&D expenditures by having many geographic markets and targeting high valued markets. At the same time, these firms are fiercely independent.

The *Middelstand* companies are considered champions of global competition but they have not succeeded alone. Banks, embassies, trade associations, chambers of commerce, governments, export trading companies and other agencies contribute to the success of the *Middelstand* export powerhouses. These peripheral groups provide details of potential export business, documentation, translation, legal and shipping services, and arrange financing.

The *Middelstand* companies, comprising thousands of firms producing an array of products, demonstrate the role and power that the smaller firms can have in a global economic environment that appears to be consolidating and merging. This model also shows how cooperation amongst all stakeholders can lead to a very competitive sector of the economy.

The forest sector in British Columbia has the opportunity to develop along the lines of the Swedish industry and Germany's *Middelstand* companies. How British Columbia succeeds depends on the drive and leadership developed by the stakeholders in British Columbia.

Implications for the industry and province of British Columbia

The impact of 'Vision 2010' is very significant. The implications for the forest industry and the Province are far-reaching. Table 1 shows a comparison of the main results under the two scenarios relative to the current situation. The 'Base Case 2010' case, with a projected harvest of 65 million m^3/year, is compared with the results which could be achieved under a 'Vision 2010' case with a 90 million m^3/year harvest and a well defined future strategy.

It is clear that the 65 million m^3 'Base Case 2010' (12% below the 1991 harvest) will adversely effect the industry and the Province. The reduction in volume will lead to employment losses in both the primary and logging sectors. Even with likely improvements in recovery and the addition of some board plants, the value of the output from the primary sector would decline relative to 1991.

However, even under the 'Base Case 2010' scenario, the value added and engineered wood products will benefit from market opportunities and increased industry focus. Consequently, the value and employment for these sectors will improve by 53.6% and 26.7%, respectively, when compared with 1991 levels.

The potential benefits of 'Vision 2010' are clear. The increase in the harvest, resulting from improved utilization and intensive silviculture, together with the implementation of the proactive strategies referred to earlier, will result in increases in value and employment. The expansions and restructuring implied under 'Vision 2010' would require approximately $3 billion. This amount would be in addition

Table 1

Forest Industry Outlook – Vision 2010 *vs.* 'Base Case 2010'

	Volume (000 m³)			*Value (million $)*			*Employment (persons)*		
Sectors	1991	Base Case 2010	Vision 2010	1991	Base Case 2010	Vision 2010	1991	Base Case 2010	Visio 2010
Primary*	38,114	34,839	50,430	5,591	5,473	7,556	32,474	25,324	34,80
Value Added	4,030	6,748	10,221	1,550	2,380	3,680	11,660	14,770	22,74
Logging	73,676	65,000	90,000	3,272	2,887	3,997	23,200	16,374	22,67
Total	n/a	n/a	n/a	n/a	n/a	n/a	67,334	56,468	80,22

* Finished volume, actual sizing, grouping of all solid wood products.

n/a – not applicable as it would result in double counting.

to the investment needed for ongoing maintenance and upgrading to keep existing facilities at competitive levels.

The primary and value added/engineered wood sectors would experience value increases of 35.2% and 137.4%, respectively. Employment would increase by 7.2% and 95.1% for the two sectors. These increases would more than offset the small reductions expected in the logging sector, due to increased mechanization.

The overall implications demonstrated numerically in Table 1 are significant:

- If stakeholders continue along the current path, the forest industry will decline in term of volume, employment and value of output and it will be difficult to attract new investment.
- On the other hand, if stakeholders adopt a common vision and develop the strategies required to pursue their vision, the industry can provide more employment and a greater contribution to the Provincial economy than at present.
- If 'Vision 2010' is adopted, the required investment capital would be supported.

THE WOOD PRODUCTS INDUSTRY IN BC
THE NEXT TWENTY YEARS

SUMMARY REPORT

By

APPENDICES

This report was prepared at the direction of the Working Group to the Opportunity Identification Program of the Forest Resource Development Agreement. This report and the Forest Summit Conference are part of an initiative supporting the development of a forest sector strategy in British Columbia.

Funding for the project was provided in part by the Canada - British Columbia Partnership Agreement in Forest Resource Development: FRDA II.

H.A. Simons Ltd. contributed the remainder of the project costs in support of the Forest Summit Conference.

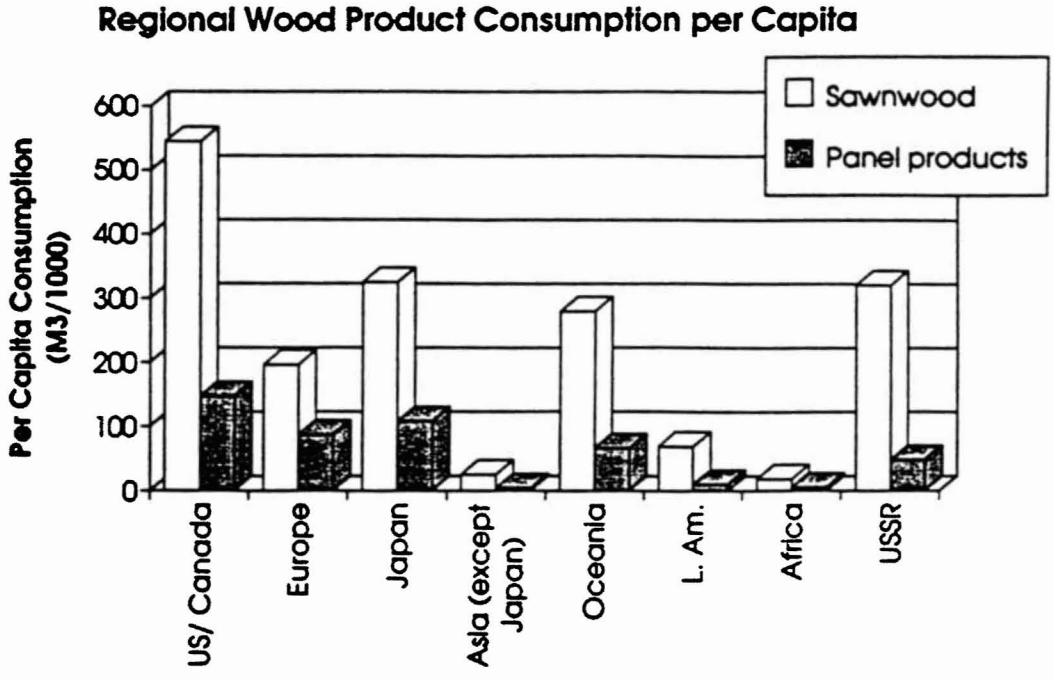
APPENDIX 1

REGIONAL MARKET DEVELOPMENTS FOR WOOD PRODUCTS

General

The use of wood products varies significantly by region and product. Figure 1 demonstrates these differences on a per capita basis. US/Canada is by far the greatest consumer of both categories of wood product. Japan uses considerable sawnwood and panel volumes also. Europe is a comparatively small user of sawnwood but consumes a substantial volume of panel products.

Figure 1



As Figure 1 shows, the developed regions are much larger users of wood products than those which are still developing. Apart from the economic aspect, the reason is primarily the construction method used. In North America, Japan and to a lesser extent Europe, wood products are used extensively for residential building, while very little is used for construction in the other regions.

The current volumes of softwood lumber and panel product consumption are shown in Figures 2A and 2B. Volume-wise, North America and Europe account for almost 60% of the lumber and 66% of the panel products. Japan accounts for a further 10% of each of the product categories.

Figure 2A

Market Demand For Softwood Lumber and Panel Products 1990

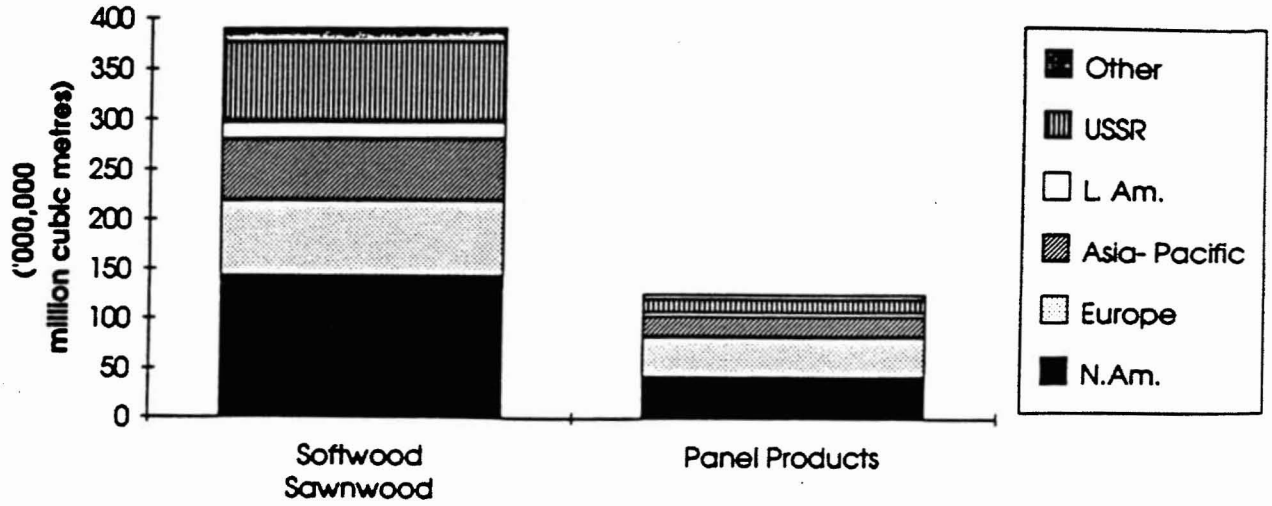
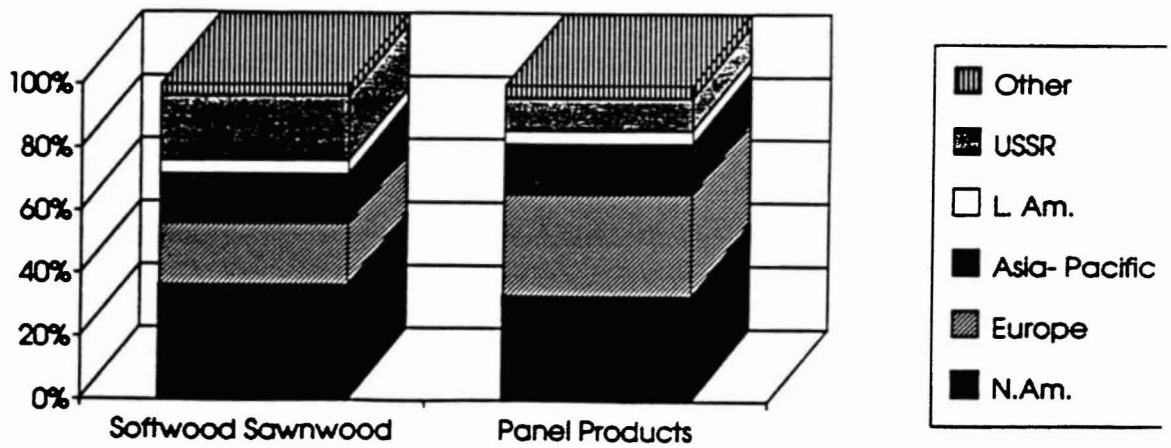


Figure 2B

MARKET DEMAND PERCENTAGE FOR SOFTWOOD LUMBER AND PANEL PRODUCTS 1990



Consumption of most wood products in the developed regions will grow below the projected GNP growth rate. Developing regions are expected to experience greater growth. But traditional building practices will not change significantly. Although total consumption will increase substantially in the developing regions, the per capita consumption will not even approach the rates that apply in the developed countries.

Softwood Lumber

The projections by the FAO indicate that by 2010 there will be well over 500 million m^3 of softwood lumber consumed per year. H.A.Simons believe this projection is somewhat excessive and that the volume is more likely to be at around 450 million m^3 compared with current trend levels of 375 million m^3 - see Figure 3.

Figure 3

Softwood Lumber Consumption Growth Projections

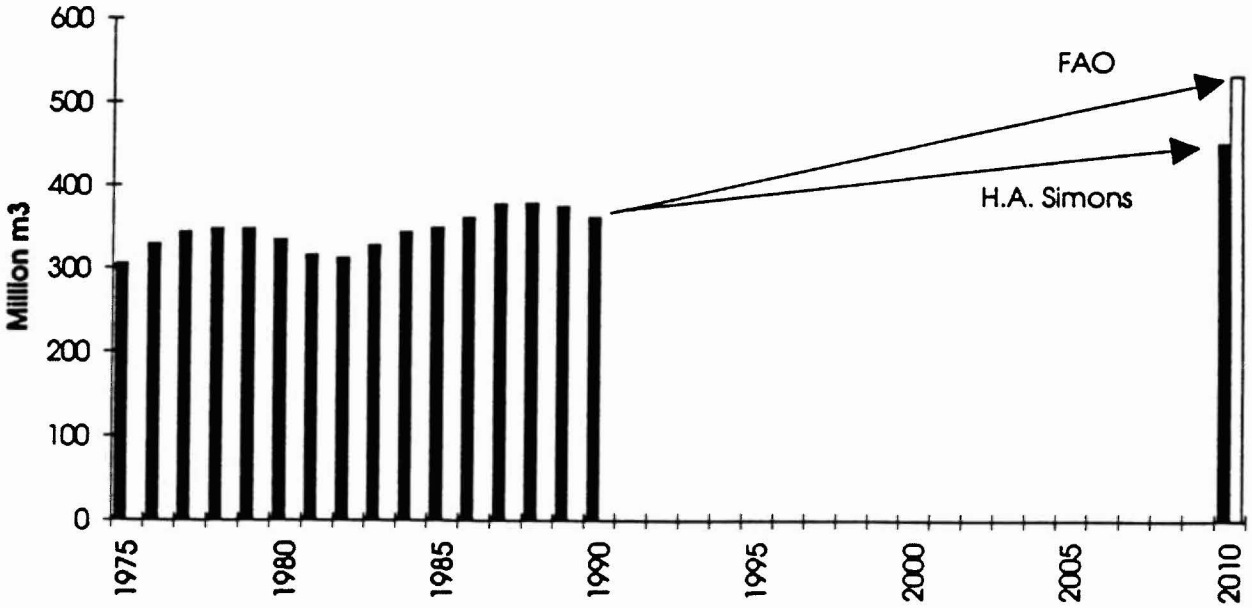
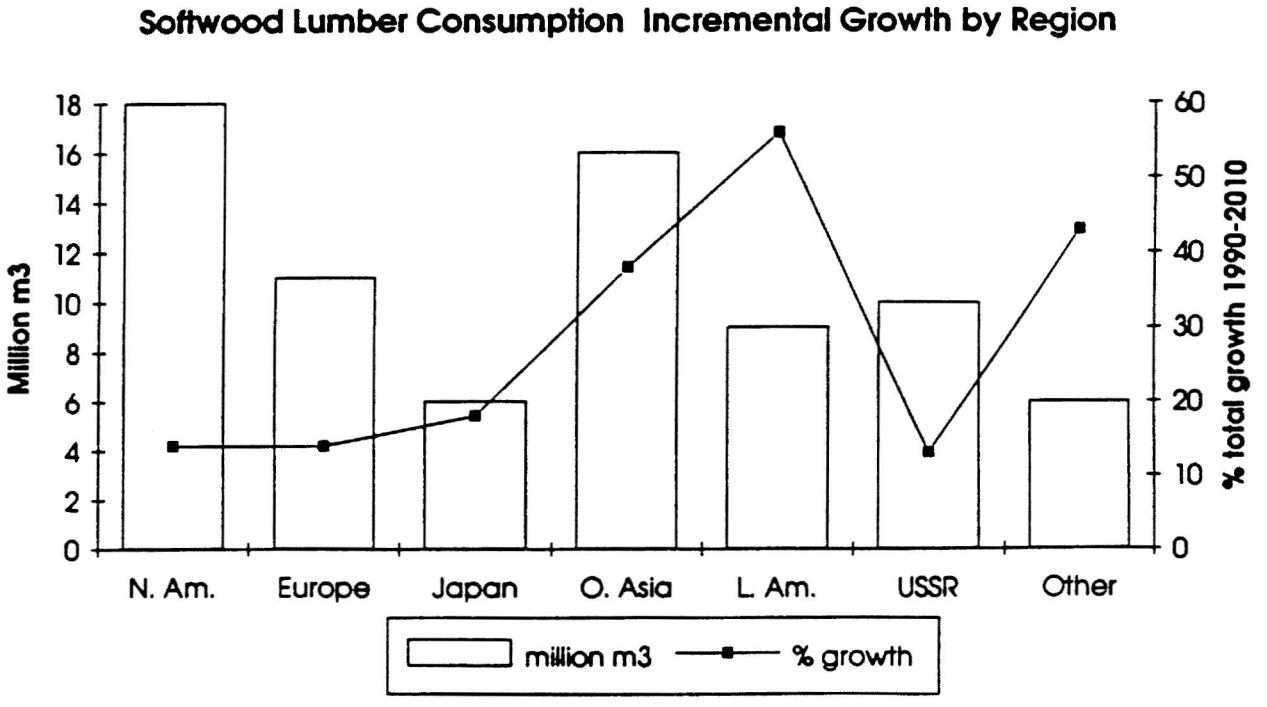


Figure 3 presents global growth. There will be significant differences between regions. BC's markets are typically in the slower growing developed countries. These markets are expected to only grow at approximately 1% per year.

Figure 4 shows the expected increases in volume for the 1990-2010 period. It also displays what these volumes represent in terms of percentage growth over current levels. Though the absolute incremental volume growth for US/Canada will be greater than any other region, the percent increase is very low. In contrast, the growth in the other regions is very substantial, both in percentage and in total volume.

Production to meet this increased demand will come principally from Latin America, Asia and Eastern Russia. Though increases in production are expected from North America and Europe, it is unlikely that incremental supply will be greater than demand, in fact it is probable that there will be some shortfall.

Figure 4



If BC producers can increase output excellent opportunities will exist. These will be in traditional regions and in new rapidly growing markets where no new production of lumber is expected, for example Korea and Taiwan.

At present, as detailed in the main report, BC Interior sawmills are competitive in the production of commodity products and the coastal mills have focused on grade and quality in order to compete in the markets. It is not expected that this situation will change substantially by the year 2010.

The principal parameters which govern production costs are fibre, labour, supplies and energy. There is little reason to suppose that the escalation in cost of each of these components will be any greater for BC than for the other supply sources.

Fibre costs are governed by stumpage and the cost of extraction. Given the public ownership of the resource, it is unlikely that cost increases will be imposed that would drive stumpage to uncompetitive levels thus harming the industry. Harvesting the less accessible sites will increase extraction costs, but these increases should be offset by increased harvest of second growth where much of the infrastructure is in place.

In common with other developed countries, BC's inflation rate will be considerably below the levels likely in the developing regions. Consequently, BC's labour component of production costs (and also the labour component of harvesting) will become more competitive when compared with the emerging supply sources. As the emerging nations become increasingly industrialised, their demand for energy will escalate with a corresponding increase in price.

In summary, the current competitive position of BC producers should remain reasonably constant in the long term.

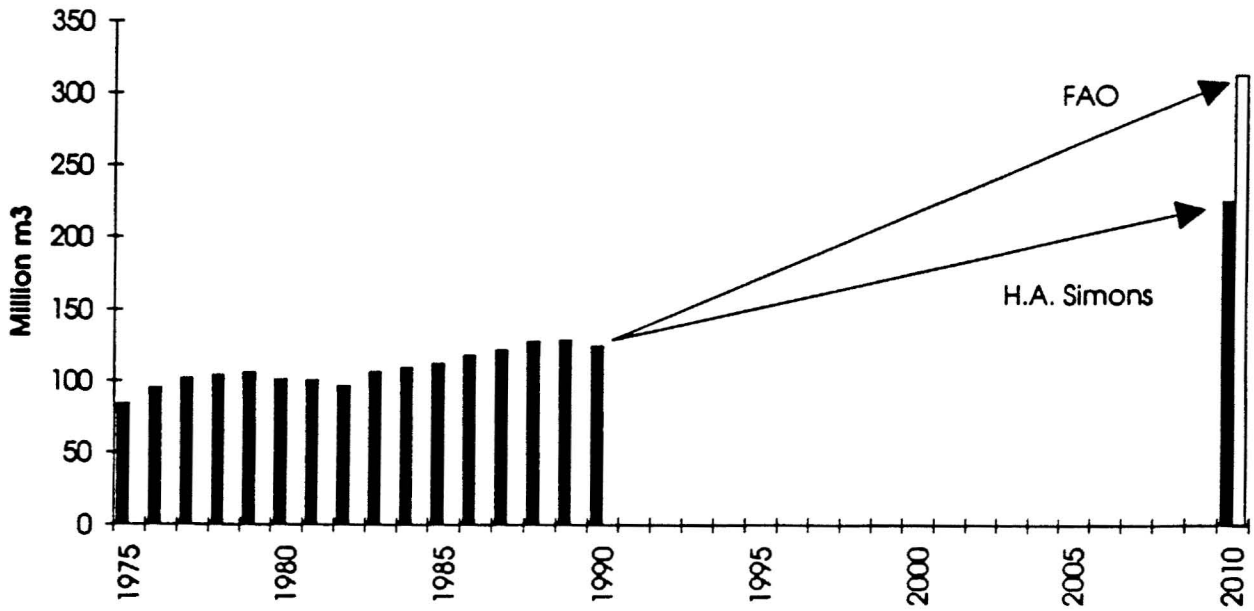
Panel Products

The panel products sector includes a great variety of products, some of which are in decline and others which are increasing rapidly. The overall growth of these products worldwide has averaged 3% per year over the last 15 years and recent projections by FAO indicate that the next twenty years will see an even greater growth rate at close to 4% per year - increasing from 125 million m^3 in 1990 to 315 million m^3 by 2010. However, H.A.Simons believes that such a high level is unlikely and projects that the 2010 level would be closer to 225 million m^3.

A comparison of these two projections in the context of historical levels is shown in Figure 5.

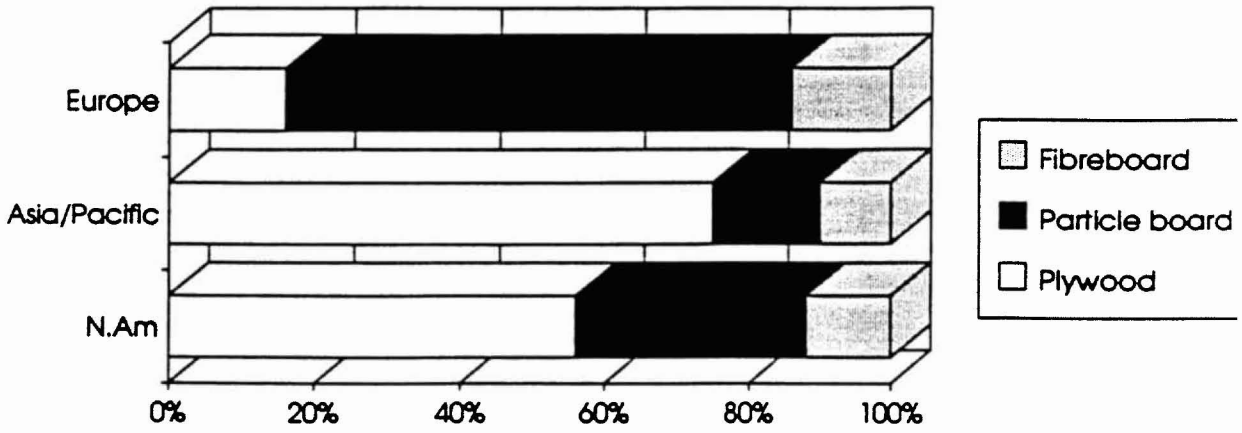
Figure 5

Wood Based Panel Consumption Growth Projections



Regional panel consumption varies according to the type of panel product used. Europe uses very little plywood but a large volume of particleboard, while the use of plywood is predominant in the Asia-Pacific region. The pattern in North America is different again. Though a significant volume is shown in Figure 6 as being particleboard, in fact much of this volume is OSB which is being used increasingly as a direct structural replacement for plywood.

Figure 6
1990 Regional Consumption
By Panel Types



In Asia, plywood is used in three main ways- structurally, in the course of construction and in furniture.

The outlook for the different panel types varies considerably. This variation results from product substitution (OSB for softwood plywood), changes in technology (new products instead of softboard and hardboard) and reduction in raw material supply (composite boards for hardwood plywood). This last change is due to the widely predicted reduction in the harvest of old growth tropical hardwoods. At present, 15-20 million m^3 of tropical plywood is consumed in the Far East. Future harvests cannot sustain this volume.

The consequence of these changes in the product type is shown in Figures 7A and 7B. Plywood's global market share was 40% in 1990, and will drop to 23% by 2010. Even this projection may be conservative. It is based on a virtually static plywood volume and assumes some production increases in other regions to offset Asian plywood production declines.

Figure 7A

Panel Products Volume

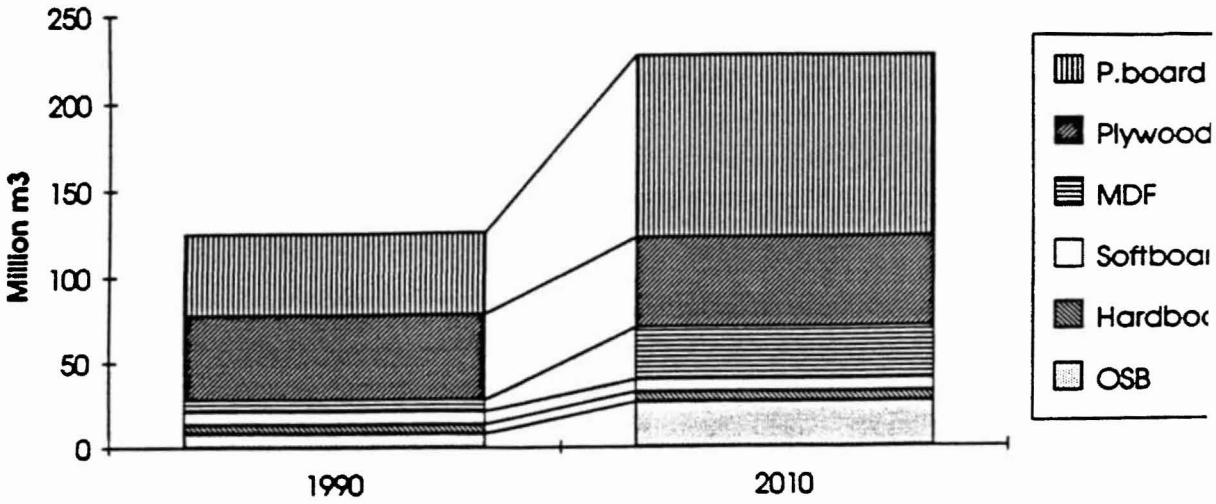
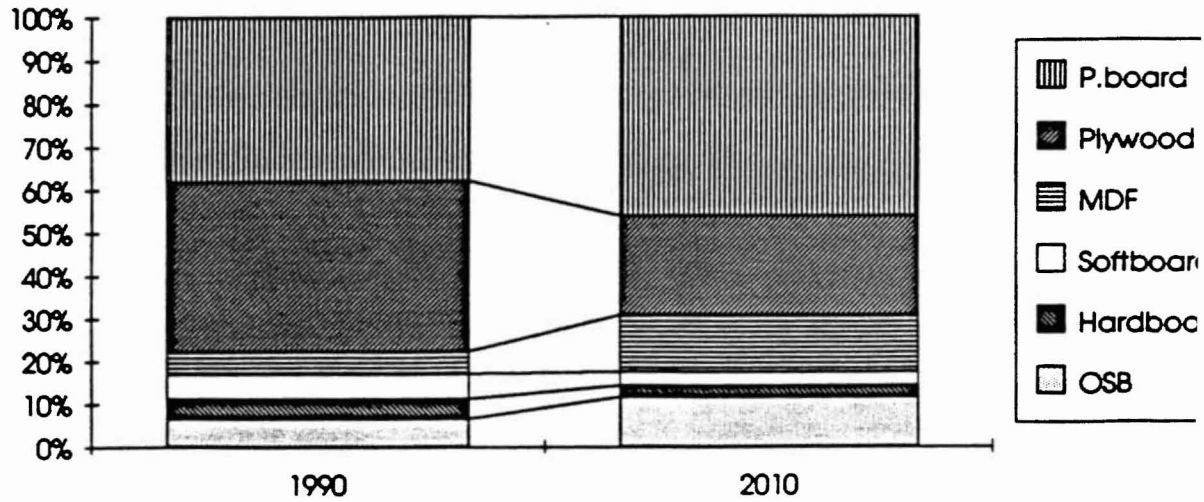


Figure 7B

Panel Products Market Share



The major growth products are the composite boards - excluding softboard and hardboard. The growth in OSB is primarily a North American phenomenon though it is possible it will find acceptance in Japan. In contrast, MDF growth will be global.

Production increases needed to satisfy composite panel demand growth will come from all regions. However, it appears likely that Europe and Asia will be in an incremental deficit (more incremental consumption than production) while Russia, Latin America and North America could develop additional supply.

The potential for BC producers to share in this growth is very promising. Composite products require the supply of residue or low cost fibre and a significant amount of energy.

BC is one of the few regions in the world that has large volumes of unutilized sawmill waste grouped closely together. Some of the largest sawmill concentrations in the world are to be found in BC, and there is no profitable use of the residue (other than the wood chips). There is also a substantial volume of low value and under-utilized fibre - specifically hardwoods but also non-commercial stands of softwood. In addition, energy costs are among the most competitive in the world. Finally, BC is well located to access the growing markets of the Pacific Rim.

Engineered Wood

Wood products have developed through time and custom rather than through any specific design process. As a result, the use of many wood products is extremely wasteful and their inherent strengths are not fully utilized.

Trusses

Currently, trusses represent over 90% of residential construction in US/Canada and the UK. They were developed as an improvement to the old roof construction system involving rafters. However, rafters are still common in other regions of the world. Sometimes rafters are used because the local tradition is for attic space, or because an alternative solution i.e. laminated beams have been used, but more usually because the building trade is slow to change.

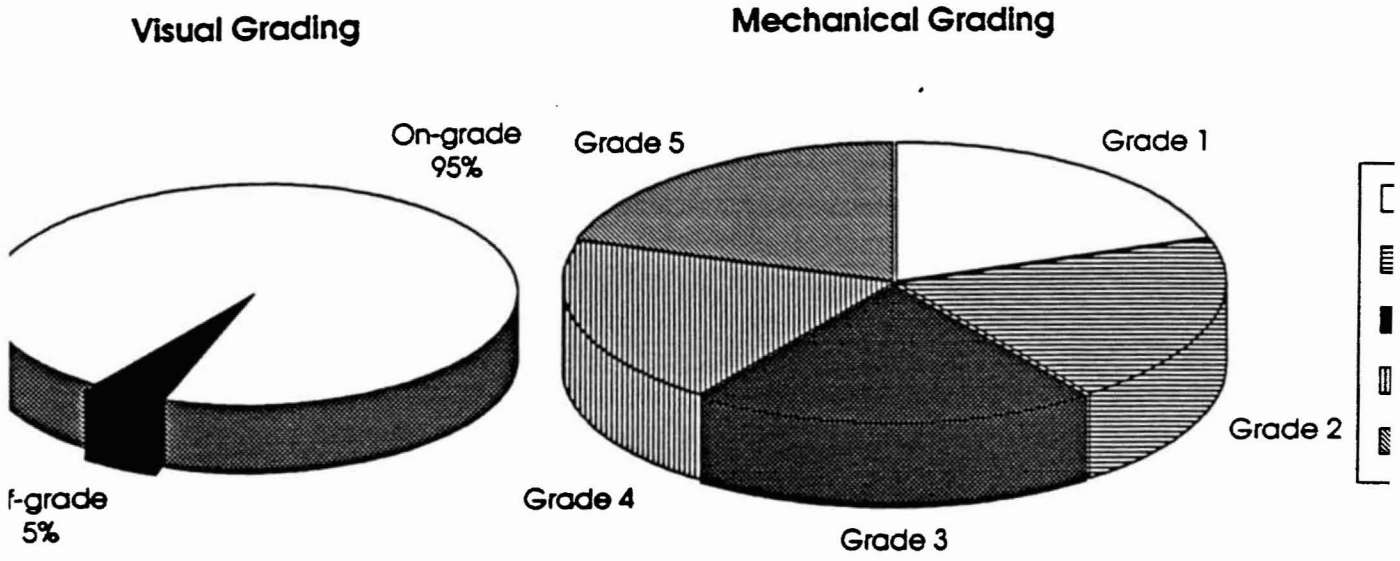
The developed regions have devised some improved products. Examples of successful engineered wood products are trusses and machines stress rated (MSR) lumber. Many more designed products will be manufactured in the future. Fast growing developing countries with rapidly increasing housing demand could become major markets for such products.

MSR Lumber

The growing use of trusses promoted a further development in the direction of engineered wood products. Truss design depends on the strength values of each component. These strength values were developed empirically and based on results obtained from testing a large number of samples. It was found that strength values varied substantially, even for a given species and grade.

Visual grading is based on 95% of all pieces being stronger than the strength values set for the grade (Figure 8). Obviously, some pieces barely make this grade, while others are much stronger than the grade requirements.

Figure 8



Effectively, therefore, the true strength of most of the pieces of lumber is not utilized.

The advent of non-destructing Mechanical Stress Rating (MSR) allows each piece to be tested and a more accurate assessment of its actual strength developed. Therefore, the same production value can be reclassified into several different strength classes (Figure 8) and used in different contexts.

The net result is improved wood utilization according to grade requirements. Premium strength material can be sold more selectively at higher prices.

The Forest Products Industry and R&D

Interestingly, neither trusses nor MSR lumber were developed by the forest industry. Trusses were mainly the result of a strong marketing and customer-oriented engineering effort by the manufacturers of the metal rail plates. MSR lumber was promoted by the manufacturers of the machines which undertook the non-destructive testing.

There are a number of similar examples. Treated wood, which is now a major item in the US South accounting for over half of the production of some mills, was developed and promoted by the manufacturers of the treating chemicals. Most of the composite products have been developed by the equipment manufacturers.

Though there have been some exceptions (for example, Parallam) the forest industry has been far from proactive in the move towards engineered wood products and in the development of specialty products based on wood fibre and designed for specific end uses. One result has been substantial substitution of wood in a number of uses - external sidings and windows are prime examples. Vinyl and aluminum now account for a large percentage of sidings and the forest industry has done little to develop products which can recapture the market.

There are two major reasons which can be identified as the cause of this problem. The first has been the predominant focus on costs. The R&D effort of this industry is well below that of most other industries (below 1% of sales) and most of this limited effort is focused on improved production processes. The second has been the focus on commodity products and a distribution system which separates the producer from the consumer. Most of the products are manufactured to a common and well-established standard and sold to wholesalers and distribution centres. There is little brand recognition and limited contact between the producer and the user.

This traditional approach is changing. There is a new family of specialty wood products specially designed to meet specific needs in the marketplace. The manufacturers are developing brand name products and differentiating their products from those of their competitors.

This new sub-sector of the industry is highly consumer oriented. There is less focus on manufacturing standards i.e. on how the product is made, and much more on what the product will do. The introduction of the performance standards approach by the American Plywood Association (APA) was an early development in the forthcoming growth of engineered wood products.

There are a few products in the engineered building component category which are already in production in BC. There is one small upgraded pilot plant producing Parallam. There are laminated beams, trusses, prefabricated housing and log homes. However, these industry sub-sectors are either principally related to the domestic market (trusses, laminated beams) or are still very small in terms of their exports (log homes).

This development is not limited to the structural use of products made from wood fibre. It is possible to develop a large number of hybrid products for specific uses. BC has a small pilot plant that produces three dimensional moulded panels for car body parts using textile fibres woven into the wood fibre mat. Even with existing semi-specialty products there are opportunities to target market niches. MDF with a fire retardant is proving very useful to some consumers. Others are interested in an exterior grade panel and this product is now being offered based on a waterproof resin. Some MDF producers have even developed the ability to vary density profiles across the thickness of the board to satisfy customers who are using the product in different ways.

Further Processed Products (Value-added)

The opportunity for more processing is pursued by all owners of resources. The products manufactured by the wood products industry can be divided into two broad categories. There are products used directly as manufactured by the primary mill, and there are intermediate products which are further processed into something else. In the latter case there may be several manufacturing steps undertaken by one or more operations before the wood product achieves the final form in which it is used.

There is greater value to be obtained in both categories but in the first category this value is achieved by manufacturing the right product for the consumer, (i.e. the engineered wood product approach discussed earlier) whereas in the second category it is achieved by vertical integration of the further processing steps.

There is a growing worldwide trend towards components - indeed in Europe there is a sophisticated infrastructure in place. The final manufacturer of a product is less interested in undertaking the conversion to produce each component. This approach has long been common in the automobile industry. Window or door manufacturers no longer buy a large cross-section of timber and extract the short small pieces needed to make the window or door. They prefer to have the precisely, dried, prepared and cut piece to be delivered just in time for its assembly into a window.

However, this approach puts them at the mercy of the raw material supplier. Window and door manufacturers (for example) must be sure they get their components on time and that these components meet all quality targets.

In Europe, the furniture and kitchen cabinet manufacturers and the producers of the composite products have developed extensive business relationships. The board producer and the cabinet manufacturer work together and ensure that the panel is cut exactly to size and laminated with the desired surface. It may even be edge bonded, drilled and dowelled ready for immediate assembly. The service may not be performed by the original composite board producer but the activity will be closely integrated between all three parties so that the critical contacts between board producer and board consumer are maintained. Rarely, and usually only as back-up, do these manufacturers saw or further process production sized sheets of particleboard or MDF.

The process flow for this category of products is shown in Figure 9 for typical lumber products. BC industry has a major opportunity to follow this process flow towards the ultimate consumer. There will, no doubt, be instances where a BC producer can achieve the complete integration to the final product. Indeed, for some products, this has already been achieved. High quality cedar furniture is being sold in Europe. Finished shrink wrapped pine panelling is being sold in the US. It is believed that some of the most promising volume opportunities will lie in the supply of components to industries using wood as some part of their ultimate product.

It will be essential that the BC industry develops credibility as a reliable supplier of consistent quality goods on time. The industry can be competitive but must shorten the distribution chain so that the primary producers, together with the facilities undertaking the further processing, are in direct contact with the user of the product.

Figure 9

EXAMPLE 1	PROCESS FLOW	EXAMPLE 2
	LOG	
CANTS	PRIMARY LUMBER	CANTS
GREEN WINDOW STOCK	BLANKS FOR FURTHER PROCESSING	22 X 107 LAMSTOCK
DRY, FINGER-JOINT AND LAMINATE	FURTHER PROCESSING	LAMINATED POSTS
PROFILE TO EXACT COMPONENT	FINISHING COMPONENTS	VENEERED POSTS
ASSEMBLE WINDOW	COMPONENT ASSEMBLY	CONSTRUCT HOUSE
WINDOW	FINAL PRODUCT	HOME

APPENDIX 2

FOREST INDUSTRY OUTLOOK

General

The main text of the report provides a summary of the outlook for the industry under two scenarios - the "Base Case 2010" and "Vision 2010." The objective of this appendix is to explain some of the assumptions which were made in order to develop the two projections and to comment on the interrelationship between some of these assumptions.

Fibre Supply

The assumptions regarding fibre supply are described elsewhere but it is important to note that not all of the strategic directions and thus the projections are entirely linked to harvesting greater volumes.

Thus, the development of strategic alliances and the adoption of a market and quality driven approach will serve to increase the activity in engineered wood products and further processing even if BC is unable to increase the harvest to the 90 million m^3 desired.

Primary

The breakdown of the volume shown under primary in Table 1 of the report is shown in the following Table 1.

Table 1
Primary Product Production
(000 m^3)

	1991	Base Case 2010	Vision 2010
Lumber	31,400	31,500	42,500
Plywood	1,450	1,135	1,600
OSB	225	800	1,000
Particleboard/MDF	250	900	1,300
Other (incl. chip/log exports)	4,800	500	4,030
Total	**38,125**	**34,835**	**50,430**

The product with the greatest variation is lumber. Under the base case, with a constrained fibre supply, it is assumed that there will be productivity improvements to increase yield and technology improvements to use lower quality logs. On this basis, it is believed lumber volume can be maintained in spite of the harvest reduction. The substantial increases in lumber shown for Vision 2010 are a direct reflection of the greater harvest.

In contrast the increase in plywood volume is not so much affected by harvest, but more by an innovative approach to export markets (mainly Japan and US). Both these markets are being faced with raw material shortages for their traditional products - tropical hardwood logs for Japan and Douglas fir logs for the US - and an opportunity is developing for BC producers.

The difference in composite products volumes under the two future scenarios is not very substantial. These products will be in strong demand over the next two decades.

The major difference under "other" relates to the elimination of chip exports under the constrained case.

Value-added and Engineered Wood Products

The values shown in Table 2 are based on a combination of slow growing domestic products and fast growing exports. There is little difference between the two scenarios for products which are mainly sold domestically (for example trusses and millwork or cabinets).

Table 2
Engineered Wood Products and Further Processed Products
($ million)

	1990	Base Case 2010	Vision 2010
Engineered Wood Products			
for domestic market	333	410	495
for export (I-beams, LVL, Parallam, hybrids)	7	90	485
Total	**340**	**500**	**980**
Further Processed			
for domestic market	520	635	770
for export	690	1,245	1,930
Total	**1,210**	**1,880**	**2,700**
TOTAL	**1,550**	**2,380**	**3,680**

In contrast, the export oriented products are expected to grow rapidly even under normal conditions. The different growth projections under the engineered wood products category are a function of incremental investment. Under the base case, where the investment climate continues to be half hearted, few new plants and new products are developed. In contrast, if opportunities are seized, partly through a strong R&D effort, the growth potential is very substantial. For example, there could be up to five LVL plants in the province by 2010.

The growth differences for further processed products are less a function of capital expenditure and more a result of a greater focus on strategic alliances between the primary producer (and tenure holder) and the secondary processor.

This part of the vision is also less dependent on additional volumes being harvested and more dependent on the other strategic directions indicated in the report. It is probable that the additional fibre which would become available would tend to be less suitable for further processing.

In Table 1 of the main report the additional revenue generated under Vision 2010 by the primary products was around $2 billion more than the base case. Most of this additional value will only develop if there is additional fibre harvested i.e. from 65 million m^3 up to 90 million m^3.

For the engineered wood components and further processed products the situation is significantly different. The incremental $1.3 billion could be developed even if the harvest is not increased to 90 million m^3.

Employment

Employment figures were derived in the following manner. The 1991 figures for lumber and plywood are actuals, the OSB and MDF figures are estimated. Included in the "other category are log exports and chip exports and other industries. These figures were then used to calculate an employment number per thousand cubic metres and employment figure per million dollar value. Processing efficiency increases were assumed and were reflected in lower "persons per volume output" numbers. Figures 1 and 2 show the employment figures for 1991, the Base Case 2010 and the Vision 2010 in the primary industries.

Figure 1

Employment Estimates Lumber

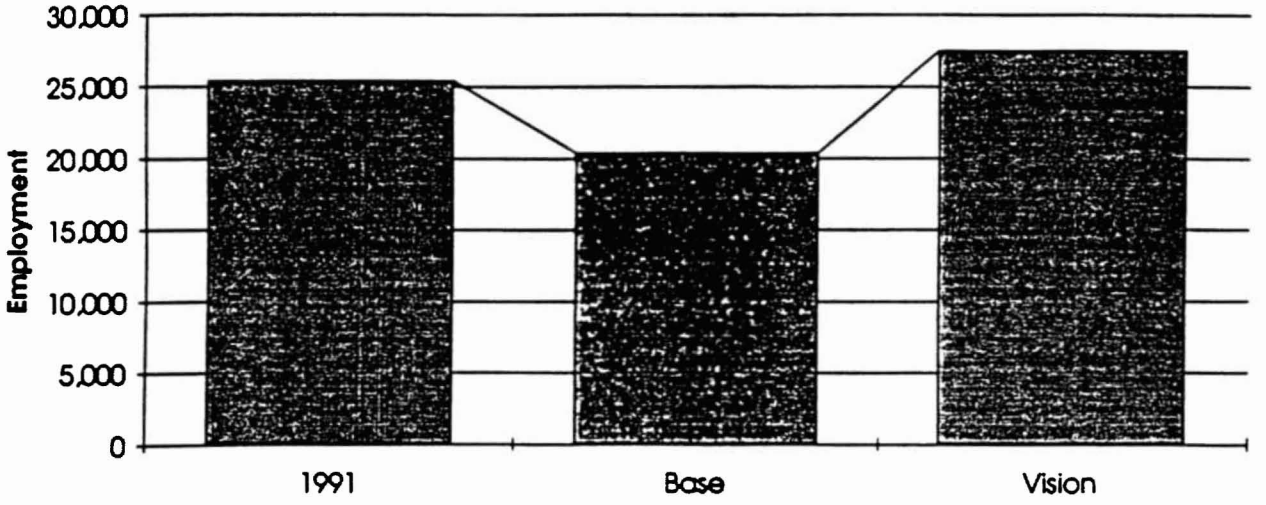
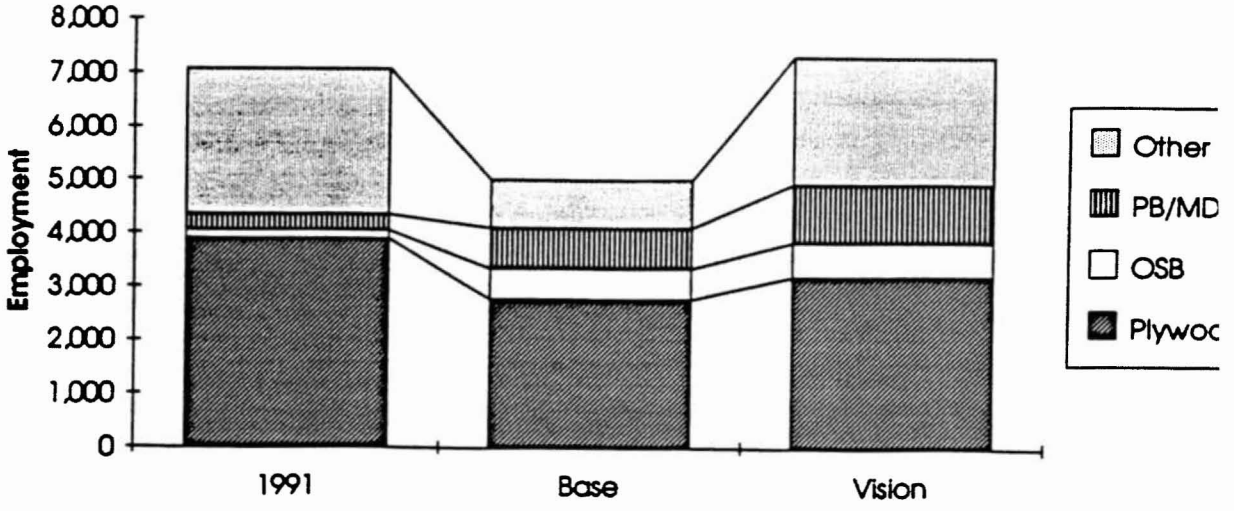


Figure 2

Employment Estimates Panels and Others

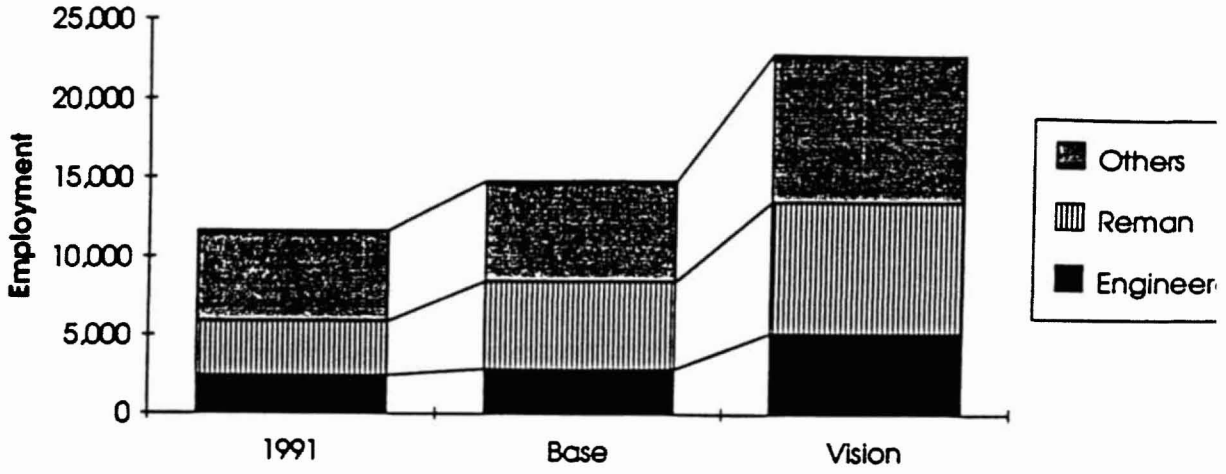


The Base Case figures for the primary industry are arrived at as follows. It was assumed that the lumber industry would increase its labour efficiency over the 20 year period by 1%/year. Employment is estimated to be 20,400 in the Base Case and 27,500 in the Vision 2010 scenario. Labour efficiency improvement numbers for the full 18 year period to 2010 for plywood, OSB and MDF are respectively 10%, 5% and 5%. For the Base Case, H.A. Simons estimates employment to be 2,800 in the plywood industry and 500 and 1,000 for OSB and MDF respectively. Under Vision 2010 plywood manufacturing would employ 3,200 while OSB and MDF producers would employ 640 and 1,500 respectively. The main difference between the Base Case and the Vision 2010 scenario is an increased improvement in efficiency of plywood production. In the plywood industry, H.A. Simons believes that labour efficiencies could increase by 1.3%/year if higher market demand is encountered especially in markets where raw material shortages will likely occur such as Japan and Korea. The raw material shortages described earlier in this report will push the BC plywood industry to become more competitive and newer technologies will likely be developed and utilized to increase its market presence.

Value-added

A similar technique was used in the value-added segment as well. Figure 3 shows the value-added industry sectors employment figures for 1991 and projections for the Base Case and the Vision 2010. Projections for the Base Case and the Vision Case were made based on person per thousand cubic metre and person per million dollar value figures. H.A. Simons believes that during the next 18 years the engineered wood products segment will improve production efficiencies by 25% while the reman and "other" segment will improve by 10% each. The improvements are likely to be the same for both the Base Case and the Vision 2010 scenarios. Employment in the reman sector is estimated to be 5,000 in the Base Case and 8,250 in Vision 2010. Engineered products will be made by 2,850 under the Base Case and 5,150 under Vision 2010. "Other" value added producers will account for 6,300 employees in the Base Case and 9,300 in Vision 2010. H.A. Simons believes both the engineered and remanufactured operations will experience healthy growth in both the Base Case scenario and Vision 2010 scenario. Future efficiencies will be identical in these two cases.

Figure 3
Employment Estimates
Value Added Industry

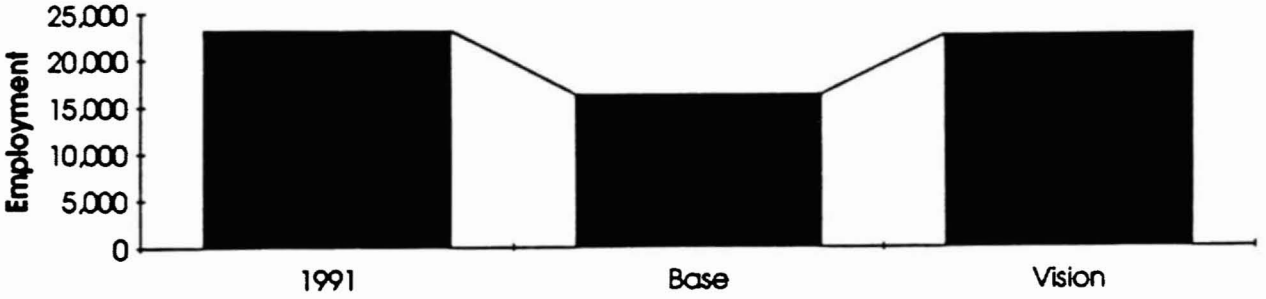


Logging

H.A. Simons believes that logging efficiency will increase by about 1%/year under both the Base Case and the Vision 2010 scenarios. This will lead to overall logging employment of 16,400 in the Base Case, while in the Vision 2010 logging employment is estimated to be 22,700. This efficiency increase will largely be through more mechanized harvesting and improved harvesting techniques requiring fewer employees. Figure 4 shows the employment figures for the logging sector in 1991 the Base Case and the Vision 2010 scenarios.

Figure 4

Employment Estimates
Logging Sector



APPENDIX 3

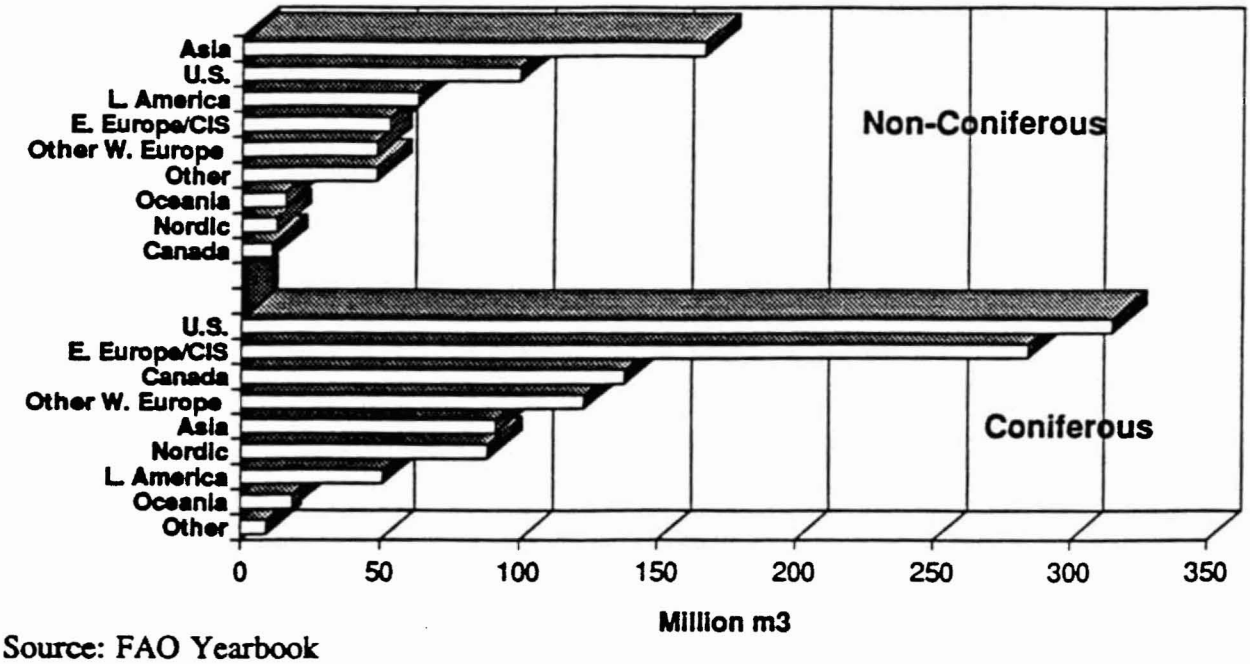
FIBRE SUPPLY SITUATION: PRESENT AND FUTURE

Global Fibre Supply Trends

During the decade of the 1980s, world supply of industrial roundwood increased by a record 245 million m^3 to nearly 1.7 billion m^3 in 1990. From 1970 to 1990, production of industrial roundwood increased at about 1.4% per year. While softwoods continue to dominate, both the total harvest and (twenty year increment) hardwood utilization increased at a rate of 1.8% per year over the 1970 to 1990 period as compared to 1.2 %/year for coniferous species.

North America provided the approximately 55% of the 1980-1990 softwood fibre increment, over two thirds of which came from the United States. As Figure 1 shows, North America continues to be the largest supplier of industrial roundwood. Over the next two decades, however, a significant change in this trend is projected. In the United States, the decline in timber availability in the West will largely offset any surpluses in the Northeast and Lake States. In the U.S. South, some new supply is expected, particularly after the year 2000.

Figure 1
Global Industrial Roundwood Production
1990



Source: FAO Yearbook

North America is the second most dominant supplier of industrial hardwoods, again with the United States being the significant supplier. North America still has large reserves of unexploited hardwood forests, much of which will enter the supply stream over the next two decades.

Europe and the former USSR combined provided about 30% of the 1980-90 softwood increment, accounting for almost 45% of the world softwood supply in 1990. The importance of these regions in the next two decades is uncertain. While there are enormous surpluses of timber available in the former USSR, infrastructure, economics, politics and management structures will limit the supply from this region over the next ten to fifteen years. Nevertheless, even when these factors are accounted for, incremental supplies of timber should emerge from the former USSR, particularly after the year 2000.

In some Western European countries, the supply of industrial roundwood presently exceeds the harvesting rates. This is particularly the case in Sweden and Finland, but also in France and Spain for coniferous timber. However, some of this timber may not be useable because of its high cost. In other parts of Western Europe, the productivity of the forests are being affected by environmental factors, such as acid rain. Consequently, very little additional supply is anticipated from many of these countries.

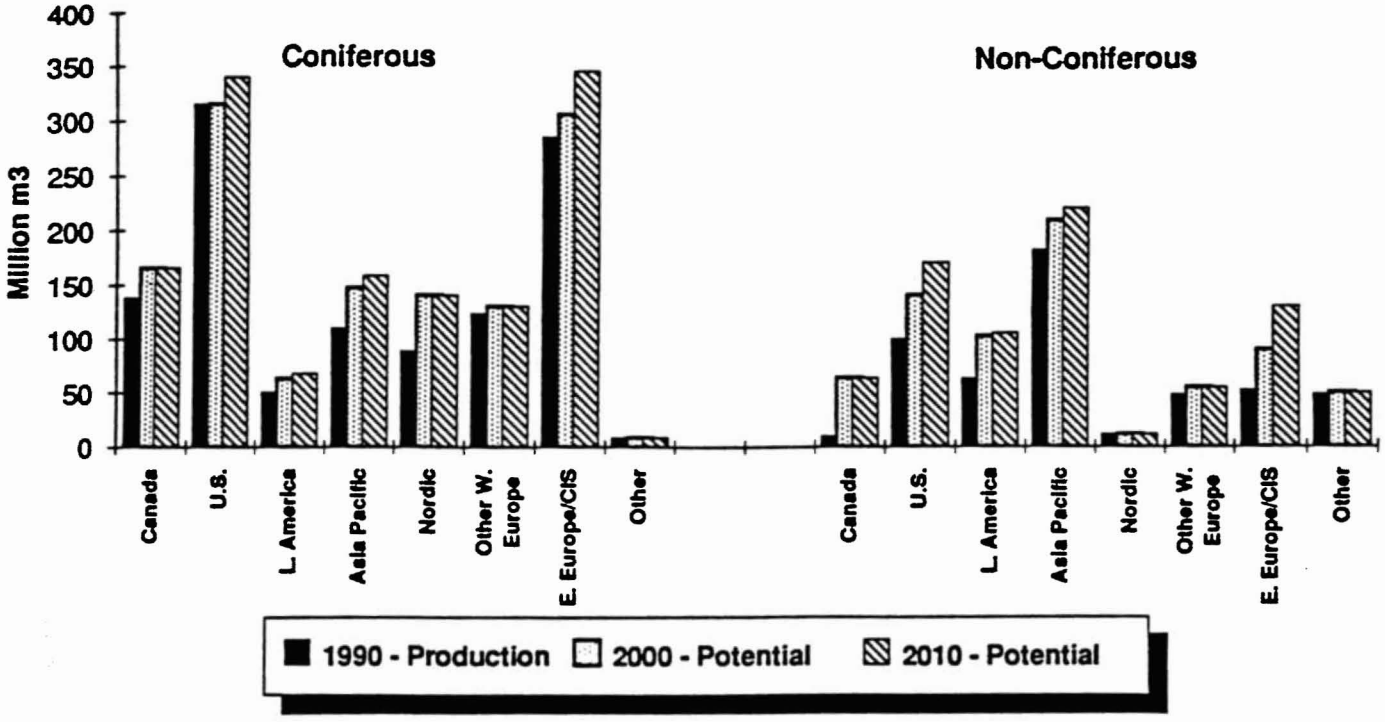
Latin America and the Asia Pacific Regions each contributed about 8% of the world's softwood increment during the past decade. Maturing softwood plantations in Chile, New Zealand, Japan, China, Australia, Brazil and other countries will make these two regions the most significant incremental supplies for industrial roundwood over the next two decades. Industrial roundwood supply from both Chile and New Zealand, for example, is forecast to nearly double by the year 2010.

Presently, the Asia Pacific Region accounts for about 35% of the global industrial hardwood fibre supply with Malaysia, China and India being the three leading producers. The outlook over the current decade is for a decline in log production from the natural tropical hardwood forests of Southeast Asia, which will just be offset by increased plantation yields. Additional supplies could emerge from developed Oceania and China. The hardwood timber potential from this region is much greater in the ensuing decade as many of the short rotation plantations mature.

In Latin America, declining production from natural hardwood forests will be more than offset by increased plantation yield. As a result, this region will emerge as the largest incremental hardwood producer over the next twenty years.

In summary, H.A. Simons predicts that the world supply of industrial roundwood will increase at about 1.4%/year from 1.7 billion m^3 today to 2.2 billion m^3 by the year 2010. The production/supply of softwoods is forecast to grow by only 1.0%/year while hardwood utilization and production will expand at a rapid 2.1%/year. Figure 2 summarizes the growth by region.

Figure 2
World Production and Supply of Industrial Roundwood
By Region to the Year 2010



Source: FAO Yearbook, H.A. Simons

BC's Fibre Supply Picture

Current Situation

In BC, estimates indicate that 85% of the total provincial area is classified as 'Provincial Forests'. Of the 85%, only about 50% is considered Crown productive and half of this is available and suitable for Crown commercial timber harvesting (BC Ministry of Forests). Most of the timber production in BC takes place in areas within this latter category. The remaining activity occurs on private or federal forest land or in certain areas of the 'productive' Crown forest land base. In total, it is estimated that approximately one third (about 30 million hectares) of the provincial area is operable for commercial timber harvesting.

At present, the allowable annual cut (AAC), which is based on the Crown portion of the productive commercial land base suitable is about 73 million m^3/year. In addition, timber is extracted from private land holdings and other land areas. Over the long term, it is estimated that the sustainable supply from these lands is approximately 5 million m^3/year. Consequently, the total industrial roundwood supply is estimated at about 78 million m^3/year.

Future Timber Supply

Fibre Constrained Scenario (referred to as Base Case 2010 in the main text)

It is difficult to predict future timber supply because of the complex number of variables at play. Recently there has been a general move by the provincial government to reduce the Allowable Annual Cuts. These reductions are arguably due to integrated resource management, environmental, and over-cutting considerations.

The ultimate outcome of these ongoing reductions is unclear, in terms of both magnitude and timing. However, there are some views in both industry and government that the AAC's in BC could be reduced by as much as 15 to 20% on average. This would reduce the AAC on crown land to about 60 million m^3/year. Augmented with private timber supply of 5 million m^3 per year, the total supply of industrial roundwood would become 65 million m^3 per year. At an average mean annual increment of 2.8 to 3.4 m^3/ha/year, this would mean that just over 20 million hectares of provincial land would be considered suitable and acceptable for commercial harvesting. In this study, we view this as a fibre constraining scenario.

The timing of the reduction will depend on a number of factors. We do not try to predict the timing of this reduction, but assume for the purpose of this study that it will occur by the year 2010, and will happen sooner rather than later.

Vision 2010 Scenario

BC has the tremendous opportunity to enhance both its fibre quality and quantity to sustain a world competitive forest products industry. This can be accomplished by employing more strategically directed crop planning practices. In some areas, for example, fast growing deciduous species could be better managed as potential fibre for pulp mills and reconstituted board mills. The objective would be to grow uniform fibre at the lowest possible costs and close to the mill site. In other areas, sawlog grade fibre of a certain quality and size may be required to meet the future needs of the industry in the area. Under current practices, however, the opportunity to explore some of these options and to fully measure their benefits and costs are restricted.

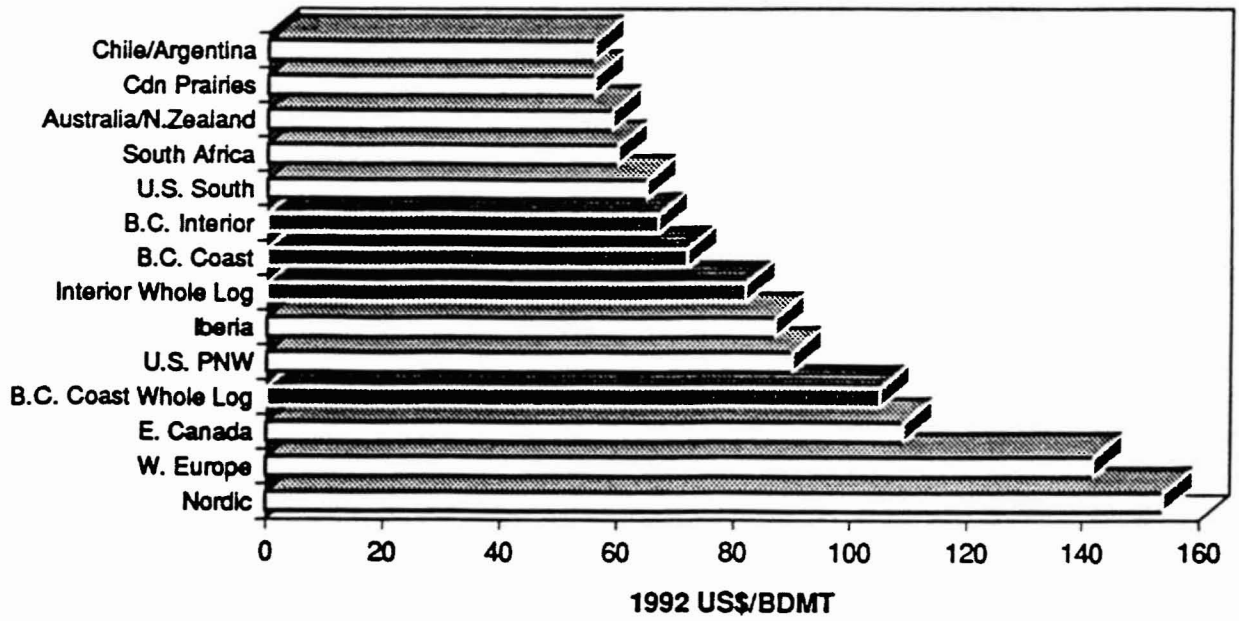
Achieving these objectives requires an improvement in the existing investment climate. What is required is a fixed area dedicated to commercial wood production, improved cooperation between government and industry in determining both medium and long term wood production goals in each region, and reexamination of the guidelines presently guiding crop planning decisions in BC.

Although the determination of the AAC in BC is a very complex process, an AAC of 75 to 80 million m^3 could be achieved with a working forest area of 25 to 30 million hectares and productivity levels of 3.5 to 4.0 m^3/ha/year. Additional timber, mainly pulplog and small sawlog quality timber, could stem from 'opportunity' wood stands, commercial thinnings and possibly through closure utilization. In short, H.A. Simons believes that 90 million m^3 per year could be sustained from productive forest lands in BC.

BC's Competitive Position

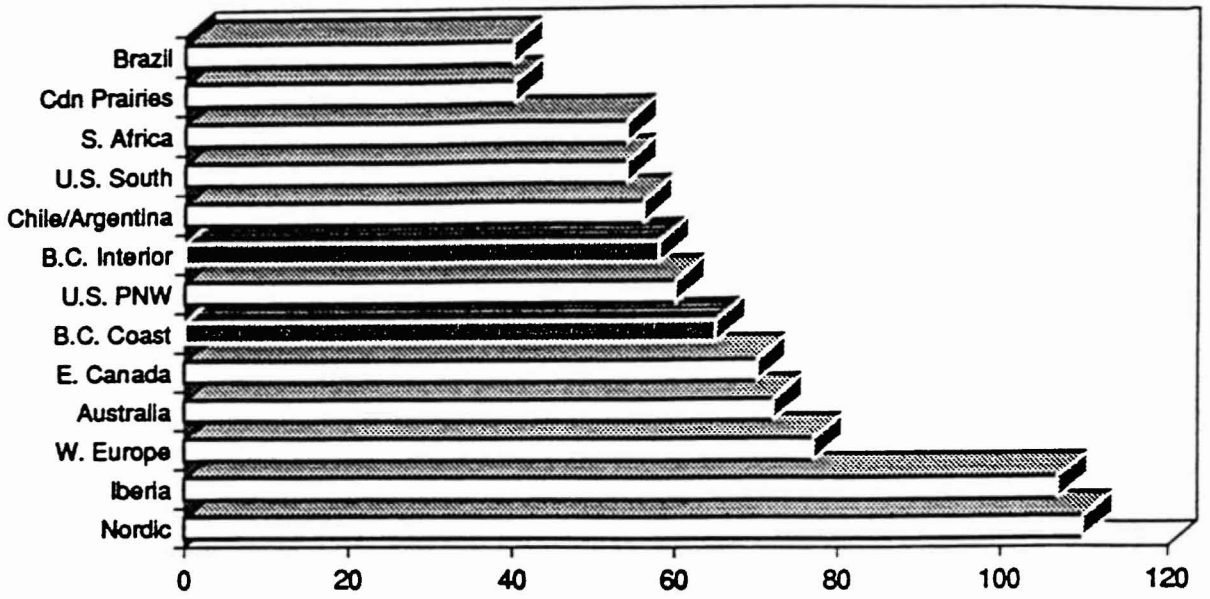
In the following three charts, we provide a present snapshot of BC's relative wood cost competitive position. The average cost of softwood fibre to the BC pulp and paper industries lies within the mid-range of the international spectrum. This means that BC is no longer highly cost competitive in wood intensive commodities such as market BSKP (bleached softwood kraft pulp). Furthermore, it should be noted that 1992 prices in BC reflect the bottom of the economic cycle, and therefore are generally higher over a business cycle.

Figure 3
Softwood Pulp Fibre Costs
1992 US$/BDMT



Source: H.A. Simons

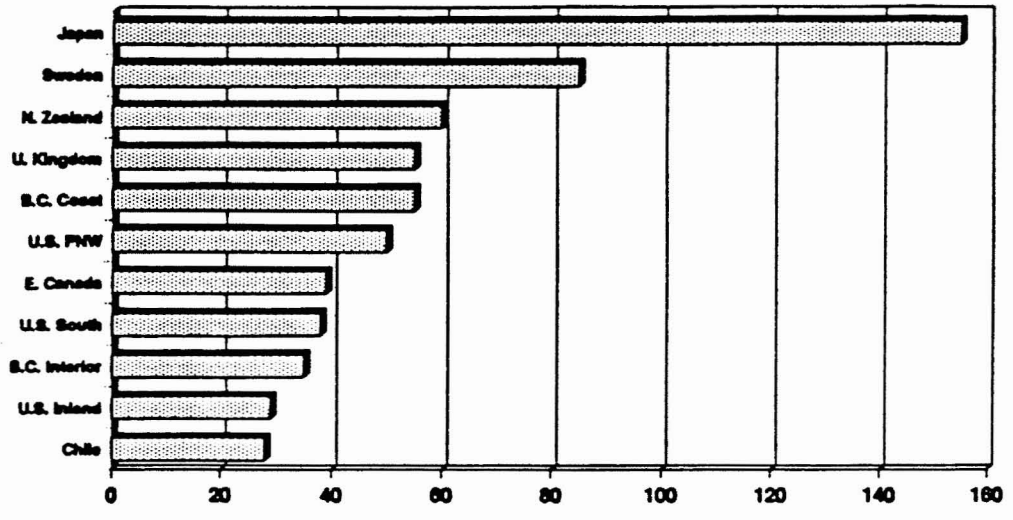
Figure 4
Hardwood Pulp Fibre Costs
1992 US$/BDMT



Source: H.A. Simons

We have also shown in Figure 3 the cost of using chips from a whole log chipper. For the Coast, these costs are considerably higher than they are for sawmill residual chips. In the Interior, the difference is not as great, but still substantial. If timber reductions occur in BC, the supply of residual chips will decline. As a result, the average wood costs delivered to both pulp mills and reconstituted board mills could go up.

Figure 5
Softwood Sawlog Fibre Costs
1992 US$/$m^3$



Source: H.A. Simons

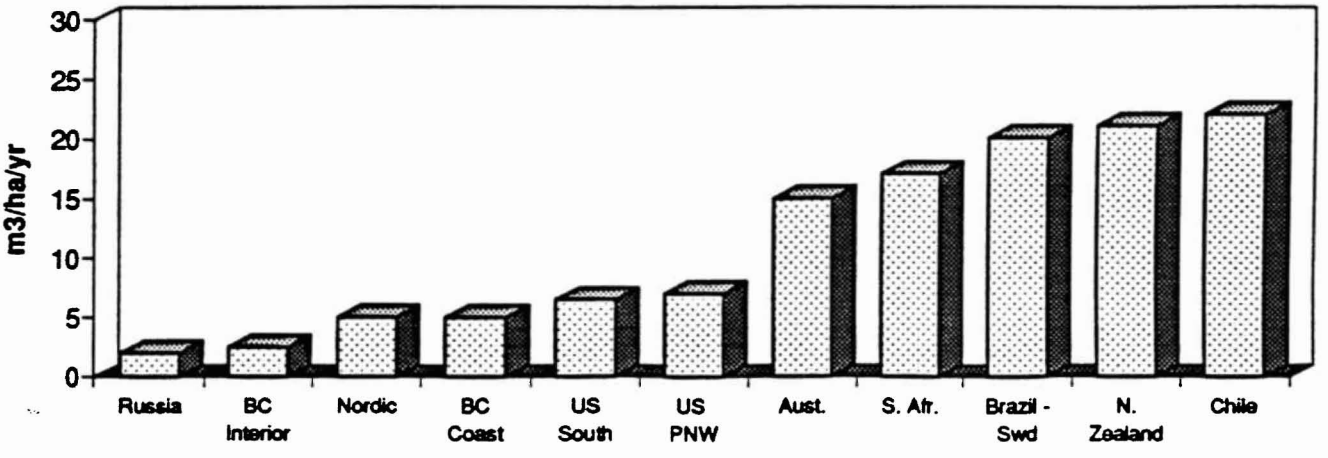
BC's hardwood fibre costs are also within the mid-range. Hardwoods account for only 5% of the BC timber supply and as a result appear to not represent a significant opportunity for the industry. However, since the principal component of the hardwood resource is Interior aspen which remains largely under-utilized, full exploitation is of considerable importance at the regional level. Also, aspen is a very desirable species for energy intensive high yielding pulps and certain reconstituted products.

Sawlog costs in BC's Interior are still cost competitive on an international basis. Costs have been increasing, driven mainly by increases in stumpage costs. Coastal logs costs are less competitive, in part being offset by the higher value added focus of the Coastal industry.

Over the short to medium term, future log costs will depend largely on timber availability relative to demand. Reductions in timber supply could put upward pressure on real log prices, both sawlog and pulplog, and chip prices. In commodity products, this would deteriorate the competitive position of the industry in BC.

Finally, the productivity of the forest land base affects BC's ability to compete. The average mean annual increment in BC is in the range of 2.8 to 3.0 m^3/ha/year, well below the 20 m^3/ha/year achieved in places like Chile. While the MAI in BC can be improved through a strategically focused wood production strategy, the industry in BC still relies on a large commercial land base to achieve the necessary economies of scale to compete internationally.

Figure 6
Comparative Forest Productivity
MAI (m^3/ha/year)



Source: H.A. Simons